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A PSYCHOLOGICAL STUDY OF TRADE-MARK INFRINGEMENT

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A PSYCHOLOGICAL STUDY OF TRADE-MARK INFRINGEMENT

INTRODUCTION

1. AIM OF THE STUDY

THIS study is concerned with the application of psychology to an important division of law, the infringement of trade-marks,—and its chief purpose is to help the courts and the Patent Office to decide more accurately the questions of trade-mark infringement and unfair competition. Our experiments have led us to the discovery of serious theoretical and practical objections to the present judicial procedure. Under the judicial procedure it is practically impossible to judge questions of infringement or non-infringement of similar trade-marks consistently. Psychology can place at the disposal of the courts established facts, bearing on questions of confusion, such as have never been arrived at before in any reported case. Straightforward psychological methods can determine whether the mark complained of does actually cause confusion, what the exact amount of the confusion is, and how it compares with the extent of confusion between other litigated trade-marks. The present study proceeds from the conviction that in giving definite answers to these questions psychology can be of material assistance to the courts.

2. VARIOUS PHASES OF THE SUBJECT OF TRADE-MARKS

The subject of trade-marks is indeed a broad and complicated one. Names, words, marks, emblems, designs, symbols, or devices, alone or in combinations, are used as trade-marks. We have restricted our investigation to trade-mark names and words. The whole subject may be viewed from at least six different angles, *i. e.*, (a) the *history and development of the use of trade-marks*, (b) the *psychological selection of trade-marks*, (c) the *economics of trade-marks*, (d) *trade-mark laws and decisions*, (e) the *ethics of infringement*, and (f) the *psychology of trade-mark infringement*. The present discussion is primarily concerned both with the psy-

chology of trade-mark infringement, and with trade-mark laws and decisions. The scope of these six divisions is about as follows:

(a) *The History and Development of the Use of Trade-Marks.*—Recent excavations reveal that trade-marks have existed as far back as 6,000 B.C. From almost the dawn of history, they were used for the same purpose as to-day, namely: to identify or indicate the origin of the commodity so marked. They were applied to a great variety of goods. Then as now they differed in kind, some being simple in design and others rather complex. When trade developed and goods came to be exchanged between neighboring towns and countries there followed a rapid increase in the adoption and use of trade-marks. There was a time in the Middle Ages when the craft guilds demanded that the merchant mark his goods as a duty to the public. Today manufacturers and dealers of all nations employ trade-marks, but the greatest increase in the number, quality, and commercial importance of trade-marks is a matter of the last two decades.

(b) *The Psychological Selection of Trade-Marks.*—Known contributions falling under this suggestive heading are rare and date back only a few years. Just now there is, however, a tendency on the part of some users of trade-marks to discard the customary "happy inspiration" way of adopting trade-marks and to adopt psychological methods of selection. After a large number of possible marks have been devised, experiment and statistics are employed to select the best trade-mark for advertising the particular article. Moreover, psychological study both of good and bad trade-marks and of advertisements has already led to the establishment of certain fundamental principles for determining the aptness and effectiveness of trade-marks, as a means of popularizing the products to which they are applied.

(c) *The Economics of Trade-Marks.*—Trade-marks play a very important part in commerce. Often the success or failure of a business is dependent on that of the trade-mark. There appear to be two methods of determining the relative financial value of trade-marks, namely, by psychological investigation and by business experience. The results of such study or experience yield information of the efficiency of the trade-mark itself, of the effectiveness of the advertising behind it, and of the good will or reputation attaching to the mark. Thru the investigations of Strong, Hollingworth, Adams, Cheney, and Geissler a foundation in methods has been laid, and initial results achieved. The vast sums of money that are spent in advertising campaigns popularize not only the merchandise

but also the trade-marks. While the trade-mark is but a means of selling the article it often represents the owner's greatest asset, the cumulative good will or reputation of his business.

(d) *Trade-mark Laws and Decisions.*—These are measures for the protection of the consuming public and of the owner of the trade-mark. In recent years the expansion of business has made the field of trade-mark law increasingly extensive and complicated. What constitutes an illegally deceptive or infringing trade-mark is defined in the United States Trade-Mark Law of February 20, 1905, as follows: "Trade-marks which are identical . . . or which so nearly resemble a registered or known trade-mark . . . as to be likely to cause confusion or mistake in the mind of the public, or to deceive purchasers shall not be registered . . ." (Sec. 5, b). In section 16 of this act there is another statement concerning unlawful simulation of trade-marks. It says: "Any person who shall . . . reproduce, counterfeit, copy, or colorably imitate any such trade-mark . . . shall be liable to an action for damages therefor . . ." In order that the imitation may be actionable, the commodity bearing it must compete in use and sale with that on which the original trade-mark is used. The penalties of the law extend to restraining by injunction the use of the imitation, assessing damages, or imposing a fine or imprisonment on the infringer. The Trade-Mark Division of the United States Patent Office rejects a trade-mark offered for registration, if found likely to be confused with another trade-mark previously registered for like goods.

(e) *The Ethics of Infringement.*—Too little attention has been given to this aspect of the subject, to require much notice, or to be of any practical significance. The little that exists may be found in the rhetorical denunciations of the plaintiff's counsel, or in the court's reprimand to the infringer.

(f) *The Psychology of Trade-mark Infringement.*—In our treatment of the subject attention will be directed mainly to this topic and its application to (d) the laws and court decisions relating to infringement.

3. LEGAL OUTLOOK

In view both of the great commercial importance of trade-marks and the desirability of an exact administration of justice in any case, the legal procedure which determines the measure of protection to be extended to a trade-mark should be trustworthy. That it is not so in fact is evident from the lack of any scientific tests for determining questions of infringement, from the blind manner in

which questions of this character are handled by the courts, and from the diversity of the results attained. A number of patent lawyers and psychologists have challenged the ability of a court to determine with any certainty or exactitude the question of confusion. The reversal of so many of the reported decisions points to the same conclusion. The reason for this uncertainty and blundering by the courts is mainly, (1) defective laws, and (2) the non-possession by the court of the real facts of the case. No attempt has ever been made, so far as reported cases show, to treat the question of confusion as one of exact fact to be determined by evidence and not by inference from the marks themselves. The extremely vague statements in the law and in decisions on questions of infringement give the courts a variable standard for their guidance, and the whole matter has belonged to the realm of guess rather than proven facts. After the court has rendered its decision as to the probability of confusion no check is ever applied to determine if it was right.

There has been no exactness of knowledge as to the mental mechanism of trade-mark confusion. Our knowledge of confusion is confessedly deficient. Not a single scientific principle has as yet been recognized or evolved by the courts to aid in determining the reality of an imitation. Neither have the courts shed any light on the mental processes of the customer while buying. An introspective study as to how the courts arrive at their conclusions would be instructive, but none has been forthcoming. Such conditions are not favorable to accuracy or consistency in the decisions.

However, a number of external and significant factors that contribute to confusing the imitation with the original have been noticed and emphasized by the legal profession. Thus, it is maintained that the intelligence of the purchaser, the degree of his attention to the trade-mark while buying, the similarity of the labels, packages and goods, and the honesty of the salesman, determine, in part whether there will be confusion of trade-marks. It is often important to know whether the salesman presents the trade-mark to the customer visually or vocally; whether the trade-mark is usually seen by the customer at the time of purchase; and whether the goods are sold in the trade-marked package, or not. An expert in dyes for example may be expected to be less easily deceived by imitative trade-marks on dyes than a person unskilled in that line. The keen interest of the expert makes him discriminate more readily between the different brands of dyes. The courts have recognized all these considerations as important, but they have differed in their interpretation and application of them, and there

is, consequently, no harmony in the decisions on questions of confusion.

Unless legal procedure is satisfied to adopt psychological methods, an innovation which seems more radical than it really is, the solution of the problem before the courts will not become easier as time goes on. Rather it will become increasingly difficult and probably less accurate. New trade-marks are introduced to the public by thousands annually. Up to December 31, 1915, there were over one hundred thousand trade-marks registered in the United States Patent Office, while each year shows annual additions to this number of about seven thousand trade-marks. But the number of unregistered trademarks in use is several times the number of those registered. Thus, with each year's increase in the number of trade-marks in use, conflict of marks becomes more prevalent and litigation increases. It has also been observed that the subtlety of infringers, in devising more cunning methods of imitations, tends to outstrip the slowly advancing wheels of justice. To suppress the infringements on their trade-marks, some firms spend vast sums of money in litigation; some even maintain special legal departments, to fight trade-mark infringement and unfair competition. As many as four or five hundred suits have been instituted by one well known company against infringers of its trade-marks, labels and packages. A casual examination of court records, or the perusal of any text-book on trade-marks will show that the most aggressive prosecutors of infringers are, in many instances, among the most successful business houses in the country. The owners of these valuable trade-marks are not, however, the only ones who suffer from the inaccuracy of court decisions. Rich and powerful houses are able to demand the suppression even of very remote imitations and to win their contentions in the courts, simply because they are able to throw a greater weight of authority and prestige into their prosecution of the case, than can be mustered by an obscure antagonist. Thus the uncetainty of present judicial methods of determining infringement assists the larger and more resourceful business, often probably in good faith, to oppress the smaller, and to stifle legitimate competition.

4. SCOPE OF THE WORK

Not only because of their commercial and legal significance have we dwelt at length upon these infirmities of our judicial procedure, but because it is the task of psychology to provide their remedies. Our study of the problem does not pretend to furnish a final solution. We realize that this is only the beginning, and that much

more remains "behind." In doing our work the first step was, to obtain, for measuring confusion between trade-marks, experimental methods that were capable of practical application. Two different psychological methods were employed: the recognition or identification method, and the order of merit or relative position method.

In the recognition experiment the observer is first shown a number of original trade-marks, and later a series of imitations. He is then asked to say whether the last series of marks, or any of them, were shown in him in the first series. This method furnishes exact numerical measurements of confusion, and determines the percentage of individuals mistaking the imitation for the original. In this way the effect of the imitation is accurately defined. This recognition experiment studies confusion from the standpoint of the customer. Whereas in the relative position experiment, confusion is studied from the standpoint of the court. In the latter method, the observer is required to arrange a number of pairs of litigated, and presumably conflicting trade-marks in order according to the relative amounts of confusion which he detects between the members of the respective pairs. Both methods were employed to secure a better insight into the problem of confusion and as checks upon each other. They are simple, straightforward methods requiring neither elaborate apparatus, nor an educated subject, and consume little time. The technique of the methods and the theory upon which they are based are fully described later.

A number of judicial decisions on trade-mark infringement were tested in these experiments with striking results. It was found that some imitations, which the courts had declared not to infringe, actually deceived more individuals than other imitations, which the courts found to be infringements. Thus it was made evident that the decisions in question were inexact and inconsistent, the use of some trade-marks being restrained improperly, and the use of others improperly permitted. Another series of experiments demonstrated the inaccuracy of the courts in treating all imitations, as falling into one of two distinct groups, those likely to deceive and those not likely to deceive. On the contrary these imitations exhibit varying amounts, from very little to almost absolute confusion, thereby forming a continuum or uninterrupted sequence.

The greatest assistance that psychology will be able to render to the law will be found in the construction of a scale, consisting of a number of litigated pairs of trade-marks, showing varying degrees of confusion. To help in accomplishing this, we have attempted herein to illuminate the mental processes of the observer, purchaser, and court. An analysis,—and incomplete one, it is true—has also

been made of some of the psychological factors entering into confusion. By examining the methods employed in devising imitations, several principles have been formulated as a general guide to aid in the detection of dangerous imitations. Other points of interest, especially to the psychologist, include the positive correlation found between the results of the recognition and relative position methods, and between the results of the recognition method, when used both with and without knowledge on the part of the subjects experimented upon, of the presence of imitations in the experiment.

Psychology hopes to render a service to law and business in this field by placing their problems upon scientific foundations. By thus simplifying the task of the courts much labor may be saved. The expenditure of time and money by the state, by courts, and by litigants will doubtless be greatly lessened. By the application of scientific methods more consistent and harmonious decisions will be rendered, and a system of trade-mark law more practically useful and more scientifically symmetrical will be developed.

In Chapter I. the literature relating to our problem is reviewed. In Chapter II. the technique and material employed are described. Chapter III. gives actual measurements of the amount of confusion between deceptively similar trade-marks. Chapter IV. deals with confusion as measured relatively. In those chapters two illustrative scales of confusion between trade-marks are shown, and their construction is demonstrated. Chapter V. presents the results of two psychological tests on the accuracy of the judicial decisions, together with some of the principals to be applied in detecting dangerous imitations.

5. ACKNOWLEDGMENTS

I very gratefully acknowledge the help that I have received from my subjects and teachers. Professors J. McK. Cattell, R. S. Woodworth, and H. L. Hollingworth have rendered much valuable aid. Mr. Arthur Wm. Barber, Secretary of the United States Trade-Mark Association, has also given me assistance. To my friend Dr. S. A. Tannenbaum, who reworded and clarified many statements in the Ms., I am deeply grateful. To Captain A. T. Poffenberger, Jr., Chief Psychological Examiner, U. S. A., at Camp Wheeler, Georgia, and of Columbia, I am also deeply grateful for his kind help and advice in numerous instances. I am most indebted to Lieut.-Colonel Edward K. Strong, Jr., of the Committee on Classification of Personnel, Adjutant General's Department, who suggested the problem to me, and planned much of the experimental technique, and whose assistance has been invaluable throughout.

CHAPTER I

HISTORICAL ACCOUNT

THE literature of psychology as applied to trade-mark infringement is drawn principally from two independent fields of thought, law and psychology. It begins with the appearance of an article on "The Market and Psychology" by Professor Münsterberg.¹ This article is of importance in that it calls attention for the first time to the application of psychology to this fertile branch of law. In criticizing the existing legal procedure, Münsterberg points out that there is no "definite standard" by which to judge an imitation. The amount of attention which the customer ordinarily shows in buying, his intelligence, and the degree of deceptive similarity that is illegal are subject to very different interpretations with the judges. The plan of solution suggested by him consists in the use of a scale, with different degrees of attention, and varying according to the difficulty of the recognition of certain impressions. The scale is to be constructed under laboratory conditions, including the "mental principles involved" in everyday purchases.

In his "Psychology and Industrial Efficiency," Münsterberg has a chapter on "Experiments with Reference to Illegal Imitation,"² but gives no data. He declares that the inability of the law to determine by means of general conceptions the exact point at which infringement begins constitutes a source of economic disturbance that cannot be removed until the psychological background has been systematically studied. Here, he thinks, the only aim of the psychologist should be to construct a scale of various similarity values, by which decisions may be made comparable and by which standards may be obtained. A little further on he suggests a somewhat different procedure, namely, to find an exact formula which may be adjustable to any marketable material. Then it will be possible to measure the deceptive similarity of an imitation, independently of individual arbitrariness, from the percentage of subjects that discovered the substitution under certain experimental conditions. Thus, provided the methods were accepted and the

¹ "American Problems," 1912, Chap. 7, 151-173; this paper first appeared in *McClures Magazine*, 1909-1910, 34, 87-93, under the title "Psychology and the Market."

² Pp. 282-293, 1913.

HISTORICAL ACCOUNT

degree of similarity necessary to constitute infringement were agreed upon, all uncertainty would disappear. This work was taken up by Dr. G. A. Feingold in a monograph that is reviewed later on in this chapter.

The year following the first appearance of Münsterberg's article brought forth an article³ by Mr. Edward S. Rogers, a patent lawyer of the Chicago bar. Chronologically Rogers' article should have appeared first, for it was he who suggested to Münsterberg the application of psychology to problems of trade-mark imitation. Rogers gives a critical analysis of the judicial procedure from the legal point of view. He believes that cases of trade-mark infringement and other similar forms of unfair trading show an "irreconcilable conflict," due to the courts' neglect of the psychology of the unwary purchaser. In the following paragraph Rogers illustrates how the unwary purchaser is merely a judicial myth:

" . . . when the court thinks the exhibit sufficiently alike that a judicially ideal unwary purchaser ought reasonably to be deceived and one steps forward and testifies that it has happened, it is hailed as a confirmation of the court's judgment and much is made of the testimony, but if in such a case no testimony of actual deception is adduced the "unwary purchaser" is pressed again into service on the pretext that he is in the course of his imaginary purchasing to be imposed upon by the imitation,⁴ . . . "

The unwary purchaser is usually assumed to represent the average person, but sometimes he is identified with any type of individual. This is indicated in two statements by Rogers, who strangely enough seems not to have been aware of the contradiction. In the one, the unwary purchaser is distinguished from the intelligent, expert, and careful person, and identified with the ultimate, ordinary, normal, everyday, unpracticed, inattentive and ignorant purchaser.⁵ In the other, it is explicitly stated that the unwary purchaser may appear in almost any station in life.⁶ With such different interpretations of terms it seems impossible to attain consistent decisions.

In a very interesting book,⁷ Rogers takes up in a critical manner an historical survey of the development of trade-marks and of judicial procedure relating to trade-marks, and gives a number of useful suggestions, on the economic and advertising aspects of trade-marks. In criticism of the present judicial procedure, he writes:

³ "The Unwary Purchaser: A Study in the Psychology of Trade-Mark Infringement," *Michigan Law Rev.*, 1910, 8, 613-622.

⁴ *Ibid.*, p. 621.

⁵ *Ibid.*, pp. 613-614.

⁶ *Ibid.*, pp. 615-616.

⁷ "Good Will Trade-Marks, and Unfair Trading," 1914.

"After an hour or so of theoretical disputation, the court takes the case under advisement and after a while writes a nice theoretical opinion and decides one way or the other, depending very largely on the eyesight of the judge and his capacity or incapacity for being fooled himself, and from the record before him no one can demonstrate that he is wrong, whichever side he takes."⁸

Rogers maintains that, in the absence of psychological methods, the remedy for this uncertain state of affairs exists in proven cases of actual deception of normal individuals. It seems to me that the opposing counsel might counter-balance those instances by an equal number of proven cases showing no actual deception, and thus leave the question of deception as unsettled as before. Rogers gives a long list of word trade-marks that have been held to infringe.⁹ It should be noted, however, that he errs in stating that they "have been held to infringe as words simply and independently of their surroundings and accomplishments." The many of these decisions on these trade-marks are simple, careful reading of the records shows that many others are undoubtedly complicated, involving various features of the labels, packages, and other legal technicalities.

Two papers by Professor Cattell that appeared about twenty-five years before those of Münsterberg and Rogers may also be considered as constituting the starting point of our problem. In those studies he obtained a number of definite results on the psychology of reading, the great scientific and practical importance of which he made clear. Their relation to the problem of our thesis will readily be noticed. Cattell found¹⁰ that, as the time of perception is only slightly longer for a word than for a single letter, words are read as a whole, the letters composing it not being perceived separately. He also found that the time is longer for long or rare words, and for words in a foreign language; that different letters in the same alphabet are not equally legible; that certain letters like capitals S, C, and E are hard to recognize in themselves; that some letters are mistaken for similar letters, as in the case of capitals O, Q, G, and C, and in the case of the small letters i, j, l, f and t. One of the many interesting results in the second article¹¹ by Cattell, is that it took a slightly longer time to distinguish words that are very similar in visual appearance, as "hand" from "band." The time of discrimination, therefore, furnishes us with an additional method for studying confusion.

⁸ *Ibid.*, p. 131.

⁹ *Ibid.*, pp. 142-143.

¹⁰ "The Inertia of the Eye and Brain," *Brain*, 1885, 31, 13, 16-17.

¹¹ "The Time Taken up by the Cerebral Operations," *Mind*, 1886, 11, 387.

In 1911 Mr. Arthur Wm. Barber, Secretary of the United States Trade-Mark Association, studied the problems of trade-mark infringement and unfair competition from the legal and psychological standpoints.¹² He believes that every trade-mark problem is a psychological problem, and that the legal rules governing their use will gain immeasurably in certainty and definiteness from the application of psychology thereto. He says that the greatest service that the psychologist can render is in solving questions of infringement of trade-marks and imitations of packages. How primitive the legal procedure in such cases is he shows plainly in the following remarks:

"Usually in our helplessness, we bring the trade-marks, labels or packages into the court, show them to the judge, and according as we are on one side of the case or the other, point out their likenesses or analyze their differences. Then the judge, in the exercise of his judicial common-sense, settles the rights of the parties as they look to him."¹³

"What we get from the court in a case thus presented is never the determination of a fact upon conflicting evidence, but the mere opinion upon the probability of a future event, the deception of the purchaser."¹⁴

This author thinks that experiment should determine the degree of ease, or difficulty with which an average person recalls the impression made upon him by an article which he is used to buy; as well as the clearness or haziness of that impression, and the extent to which the clearness of that impression varies with the character of the article, its uses, and its price. The vividness of the recollection of the original article depends on the character of the trade-mark, the intelligence of the purchaser, the importance and the frequency of the transaction, *e. g.*, whether the article purchased is a cigar or a piano. Furthermore, experiment should be able to determine upon what particular features of a given trade-mark, label, or style of packing recognition mainly depends; and what degree of similarity to the familiar form of the original article, its style of marking or packing, is confusing. Barber concludes with a pleasing picture of the improvements in the methods and results of judicial inquiry, when the testimony of psychology shall replace the conjectures of the court.

The only case that I have been able to find containing anything like a psychological test of confusion is one that came up in the Patent Office in 1912.¹⁵ The word "King" had been refused regis-

¹² "The Psychology of Trade-Marks," *Bulletin of the U. S. Trade-Mark Assn.*, 1911, 7, 152-165.

¹³ *Ibid.*, p. 162.

¹⁴ *Ibid.*, p. 163.

¹⁵ *Ex parte*, J. C. Blair & Co., 2 Trade-Mark Rep., 483, 104 Ms., Dec., 136, Jan. 13, 1913, Manuscript Decision of the Patent Office.

tration by the Examiner of Trade-Marks, because of its deceptive similarity to the previously registered trade-mark "Shen-King" used in connection with similar goods. This decision was, on appeal, over-ruled by the Assistant Commissioner, and the word "King" was admitted to registration. On the argument, applicant's counsel stated that, in a test made by him, the adult members of his family said that they would not purchase paper bearing the trade-mark "Shen-King" when they desired to purchase the paper marked "King." The Assistant Commissioner states that he put the test to several employees in the Patent Office and a majority immediately responded that they would not be confused by the concurrent use of the two marks.

Both counsel and the Assistant Commissioner committed the error of testing for the confusion of "Shen-King" with "King." Their questions sought information as to whether goods of the original or first mark "Shen-King" would be mistaken for those of the second or imitative mark "King." What in fact usually happens in the use of trade-marks is that acquaintance is first formed with the original or earlier mark, and that confusion is more likely to happen in the direction of mistaking the imitation which appears later for the original than of mistaking the original for the imitation.

The language of the law and of the judicial decisions is clear that the confusion to be considered is that of the imitation with the original. That there may be an equal amount of confusion of "King" with "Shen-King" as of "Shen-King" with "King" would be no reason for using the couplet of trade-marks in the latter order. Tho there would in some cases be little or no difference in the amount of confusion found by means of either couplet, in other cases there may be a great deal of difference. Neither the Assistant Commissioner nor the applicant's counsel give any figures from their tests. The counsel's family were unanimous that in their opinion the goods under the two trade-marks would not be confused. But a test for the deceptive similarity of trade-marks is not necessarily determined by the existence of deceptive similarity between their goods. It is not clear from the record whether the majority of the Patent Office employees would not have been confused by either the goods or by the names. Furthermore, the opinions of those tested do not give information as to the actual existence or non-existence of confusion. The reliability of the counsel's statement must be decidedly lowered in view of the probable prejudice resulting from the wish of his family to see him win the case. The Patent Office employees are also unsuitable subjects for tests of this character, because they

are a specially skilled class of individuals, who are more than ordinarily familiar with the subject of imitations.

An imitation trade-mark and its article may not only be mistaken for the original trade-mark and its article but may, as Professor Hollingworth remarks, simply remind us of the latter or the general atmosphere surrounding it.¹⁶ A trade-mark should popularize the article on the market and then keep it popular, by virtue of its being easily recalled, recognized, and asked for. To effect the choice of such a trade-mark the memorability of different kinds of facts must be considered. As Hollingworth says:

"In selecting a trade-mark by which goods, designed for popular consumption, are to be known, it is of real value, for instance, to know that *persons*, and *faces* are more easily remembered than *objects*, and *objects* more easily than *actions*; that *form* is more easily remembered and recognized than numbers. More numbers can be remembered than colors, but they are likely to be wrongly remembered or remembered as existing in a false order or position."¹⁷

He also found that the relative accuracy in reporting different kinds of facts when subjects are directly questioned about them, runs from 97 to less than 8 per cent. The order of accuracy is: presence of things, number of people, space relations, conditions of objects, order of events, color, size and quantity, sound, time, and actions. From this we may infer that, as parts of a trade-mark, these features are likely to play varying rôles in producing confusion.

In a second experiment, perhaps the first psychological study of trade-marks, Hollingworth found large variations in the relative attention and memory value of geometrical forms representing many common trade-marks symbols.¹⁸ The correct recognitions ranged from 28 to 92 per cent. "The general principle suggested by this experiment is that those forms are best remembered to which specific names can be given, as 'star,' 'crescent,' 'crown,' etc."

In this connection, Miss Edith Mulhall working with pictures, forms, words, and nonsense syllables suggests also that trade-marks having a wealth of associations will be recalled and recognized more easily.¹⁹

There is no doubt that upon the recognitive value of a trade-mark may depend its chances of being displaced by an imitation. In his chapter on "The Psychology of Trade-marks and Trade-Names," Hollingworth emphasizes the principle that trade-marks to be valu-

¹⁶ "Advertising and Selling," 1913, 198.

¹⁷ *Ibid.*, pp. 208-210.

¹⁸ *Ibid.*, pp. 212-213.

¹⁹ "Experimental Studies in Recognition and Recall," *Amer. J. of Psychol.*, 1915, 26, 218, 226.

able must make vivid and permanent impressions, inasmuch as recollection and recognition are their primary functions.²⁰

In the principles underlying the invention of trade-marks may lie one reason why they so often conflict. A large number of trade-marks have been grouped by Professor Louise Pound according to the mode of their formation. It is seen that those that fall under the same heading often display a striking similarity.²¹ There are all kinds of word or syllable combinations, shortenings, and extensions, diminutions, arbitrary new formations, fancy or phonetic spellings, striking hyphenations, novel capitalizings, and blendings. It is evident that when it becomes popular to add the same kind of prefix, suffix, or diminutive to trade-marks, a greater likelihood of confusion results.

To the recent increase in our knowledge of recognition no one has contributed more than Professor Edward K. Strong, Jr. His careful investigations of a variety of problems have yielded results of great theoretical and practical importance.²² They include experiments on the nature of recognition, its relation to certainty, localization, association, free association, the effect of the size of advertisements and the frequency of their presentation on recognition, of the length of the series, and of the time interval on recognition and its relation to Ebbinghaus' curve of forgetting. The recognition procedure used in many of these experiments has been the model after which that in the present investigation has been fashioned. It is the main purpose of advertising, Strong maintains, to develop a very strong associative bond or connection between the need for a commodity and a trade-mark, and the development of a very favorable attitude toward the latter.²³

Dr. H. F. Adams makes an important contribution in his experiments measuring the strength of the bonds between commodities and trade-marks.²⁴ On the average the association time was 1.90 seconds when the stimulus word was the trade-mark and 2.36 seconds when

²⁰ "Advertising, Its Principles and Practise," Tipper, Hollingworth, Hotchkiss, Parsons, 1915, 132-133.

²¹ "Word-Coinage and Modern Trade-Names," *Dialect Notes*, January, 1914, 29-41.

²² "The Effect of Length of Series upon Recognition Memory," *Psychol. Rev.*, 1912, 19, 447-462; "The Effect of the Time-Interval upon Recognition Memory," *ibid.*, 1913, 20, 339-372; M. H. Strong and E. K. Strong, Jr., "The Nature of Recognition Memory and the Localizations of Recognitions," *Amer. J. of Psychol.*, 1916, 27, 341-362; and others.

²³ "The Effect of Size of Advertisements and Frequency of their Presentation," *Psychol. Rev.*, 1914, 21, 139.

²⁴ "Advertising and Its Mental Laws," 1916, 180-195.

the stimulus word was the name of the commodity. When the trade-mark was the stimulus the subject was asked to respond by naming the first commodity suggested, and vice versa. Dr. Adams believes that this experiment is "a measurement of the advertisements which have been most effective with any given individual." His tables clearly show which trade-marks are most often thought of in connection with their commodities; and which commodities bear trade-marks that are well known, or little known. The commodities most widely advertised were most frequently mentioned in the experiments. Another experiment of Adams showed a certain amount of confusion between trade-marks and slogans, and between the commodities to which they were attached, and pointed to inefficiency in advertising.²⁵ He cites a number of tables from a study by Cheney.²⁶ They indicate the strength of associations between the following couplets: firm names and their products, trade-marks and their products, trade-marks and their firm names, firm names and their trade-marks, slogans and their firm names.²⁷

A very interesting and instructive study has been made by Dr. L. R. Geissler in connection with trade-marks and commodities.²⁸ He planned to see how one could be best persuaded to buy a certain brand of goods and to obtain a "general insight into the mind" of a prospective purchaser of a given article. To do this experiments were conducted to see which brands of articles are thought of first, most frequently, and why.

In an earlier study by the writer²⁹ of the accuracy of court decisions, on questions of confusion of trade-marks, the figures representing the percentage of confusion produced by infringing and non-infringing imitations are incorrect. More careful examination of the litigated cases from which these imitations were selected indicated that some were not appropriate for use in testing the accuracy of the decisions. The authors of the textbooks from which some of the imitations were selected had committed numerous errors, as was later discovered. This necessitated the omission of a number of imitations that had been included among the infringements and non-infringements, and accordingly changed the average amounts of confusion and the average percentage of overlapping, which gave the

²⁵ *Ibid.*, pp. 203-204.

²⁶ *Ibid.*, pp. 175-179.

²⁷ *Printer's Ink*, August, 1914, 61-62.

²⁸ "Association-Reactions Applied to Ideas of Commercial Brands of Familiar Articles," *Jour. of Applied Psychol.*, 1917, 1, 275-290.

²⁹ "Experiment versus Court Decision," an abstract of a paper read before the New York Branch of the Am. Psychol. Ass., *J. of Philos., Psychol., Etc.*, 1915, 12, 45-47.

measure of the accuracy of the decisions. Nevertheless, the general conclusion of the experiment,—that the judicial decisions were unreliable,—remains unimpaired.

Dr. Gustave A. Feingold, working under the direction of Münsterberg, has made a very interesting study that is more related to our own than is any other that has been so far made.³⁰ The purpose of his investigation was to supply "a scientific guide to courts of law whereby they could settle disputes arising from Trade-Mark Infringement more equitably."³¹ His study is also suggestive and valuable to psychological theory because he made several important discoveries about recognition.

Before considering his guide or Correction Formula for the courts we shall briefly review his methods and some of his findings. In one set of his experiments Feingold used words as his material and in another picture post-cards. Two methods were used by him in getting the objective similarity of the various pairs of words, the "mathematical" and the "psychological," as he calls them. He alone measured the mathematical similarity by rating each pair of words, on a percentage basis, according to the number of symmetrically or correspondingly arranged identical letters that they contained. The psychological similarity was obtained by having 35 individuals estimate the similarity of each pair of words in terms of percentage. The next step was to see how well each pair of words could be recognized. Eight words were typewritten in capital letters in two vertical columns on 3- by 5-inch plain filing cards. These cards came in pairs; the first was the original card shown to the subject; and the second the variable which, with the exception of the change, was a reproduction of the first. In all the experiments the interval between the first and second exposure was twenty seconds. The original and variable cards were each exposed for four seconds. The cards were seen thru a window opened and closed by a drop shutter. Before the experiment began the subject was told that he would be required to name on the second card all the words that were changed and the original ones that had been displaced. On the variable card all the words might be changed, all but one, only one, or none, i. e., 8, 7, 1, or 0. After the recognitions, introspections were asked for.

In connection with the experiments with words, three methods of recognizing an object were noted:³² (1) by memory images that

³⁰ "Recognition and Discrimination," *Psychol. Rev., Monogr.*, 1915, 18, No. 78.

³¹ *Ibid.*, p. 111.

³² *Ibid.*, pp. 44-45.

persist from the presentation to the test; (2) by the revival of faded memory images thru the re-perception of the original object or merely by the perception of the position originally occupied by the missing object; or (3) it may be a matter of feeling, kinæsthetic attitude, adjustment, or of the revival of a mood. In connection with the post-card experiments two methods of recognition were observed.³³ The variable card was recognized because it lacked something that appeared on the old card, or because a new element was noticed. Among the objective factors³⁴ that determined recognition, a change of position, as right and left, up and down, was the most easily recognizable factor; change of direction was next most easily recognized; human beings were more distinguishable in various attitudes than animals; and animate things were in general more distinguishable than inanimate.

From a comparison of the introspective and objective data, Feingold brings out the following points, which are instructive in a psychological analysis of errors of recognition:³⁵ Failure to remember the original; incomplete perception of the original; incomplete perception of the variable, mistaking it for the original, owing to the superiority of the ideomotor force over the sensory-motor force. "With high similarity the majority of errors are due to the obliteration from memory of the original N [normal] impression by the perception of the V [variable] stimulus, owing to the superiority of the sensory-motor force over the ideomotor force." "Doubt arises from a conflict of these two factors—the perception or the memory triumphing according as objective similarity is high or low." Errors also occur with the rise of a new association in connection with the original which makes it seem new; and with the failure of the original to revive the same associations as when first presented.

The complexity of the picture-post cards made it difficult to analyze the errors of recognition,³⁶ but by far the majority of errors were due to the obliteration from memory of the original by the perception of the variable. The feeling familiarity aroused by the identity of the other cards was another source of error. "In general, the mistakes were directly due to the degree of similarity, . . ."

His experiments took up the following variants:³⁷ (1) The effect on recognition of the distribution of attention; (2) of the time of perception; (3) of similarity and whether there is a "mathematical"

³³ *Ibid.*, p. 92.

³⁴ *Ibid.*, pp. 98–99.

³⁵ *Ibid.*, p. 49.

³⁶ *Ibid.*, pp. 99–100.

³⁷ *Ibid.*, p. 8.

relation between the two; (4) the difference between the effects on recognition of structural and meaningful similarity; (5) the difference between substitution and interchange of position; and (6) the influence of old and new environments.

It is found³⁸ that recognitions varies "inversely as the number of objects perceived—time being constant"; "inversely as the number of objects exposed—time being proportionate and not more than one second per object"; and "directly as the temporal length of perception."³⁹ But, for reasons which cannot be discussed here, we do not agree with Feingold's conclusions on the influence of the old and new environments.⁴⁰ The ratios of their difficulty are far too high, and the arithmetical reasoning behind them is inconsistent and wrong.

Similarity in meaning and in structure are found to produce confusion in recognition.⁴¹ It is also stated that similarity in meaning "has no fine gradations, the highest attainable degree being that which would fall midway on the scale of structural similarity." We cannot, however, accept this statement because the very data on which the two points in it are based show them to be false. Fine gradations are shown not only in similarity but also in recognition, as in columns 4 and 5 of Table 5.⁴² Feingold's use of the phrase "structural similarity" seems ambiguous here, but perhaps means the percentage of correct recognitions to which it is inversely related. The pair of words "obtain—acquire" in Table 5 with 10 per cent. correct recognitions or 90 per cent. confusion, lies far above the midway point on the scale, in fact it is very near the upper limit.

Next we will pass to one of Feingold's principal conclusions. "There is a simple inverse relation between degree of similarity and recognitive ability, the one being to the other in terms of percentage, as $X: (100 - X)$."⁴³ The accuracy of Feingold's statement, as to the relation of similarity and recognition, is of vital importance to the validity of the guide or Correction Formula. At first sight the statement seems plausible enough, but let us look at the data. This law, as Feingold calls it, is based on a comparison of the degree of mathematical similarity of forty pairs of words with the percentage of time that they are correctly recognized. When the averages that support this law are consulted in Table 8⁴⁴ it is found that they

³⁸ *Ibid.*, pp. 113-114.

³⁹ See the remarks on these three conclusions in the paper by M. H. Strong and E. K. Strong, Jr., *op. cit.*, pp. 349-350.

⁴⁰ *Ibid.*, pp. 61, 113.

⁴¹ *Ibid.*, p. 60.

⁴² *Ibid.*, p. 27.

⁴³ *Ibid.*, p. 61.

⁴⁴ *Ibid.*, p. 36.

hold only approximately, the variations running from 2 per cent. to 12 per cent. in the uncorrected results, and from 4 per cent. to 17 per cent. in the corrected results. The duplicate and new scores are not taken into account here. When the two scores of the individual pairs of words are consulted, the variations run from 0 per cent. or exact agreement to 62 per cent. or more than six-tenths of the distance to complete disagreement; these are uncorrected results and no corrected ones are given. When the variations from a formula (which does not indicate that there are any divergencies) are as large as 62 per cent. at a single step, the extremes of the scale differing by only 100 per cent., it is objectionable to state that the inverse relation is a simple or exact one. Furthermore, no figures are given to show the limits within which the relation between degree of similarity and recognition is inverse. There is no doubt that among many words an inverse relation holds, but Feingold's results do not justify the ratio $X : (100 - X)$.⁴⁵ Neither do the tables containing the results of the picture-post cards experiments reveal evidence for this simple inverse relation.

Any guide for practical application in the courts should be good psychology, and should be examined carefully by psychologists. Feingold offers a Correction Formula as a guide. It is stated in his preface that to furnish such a guide it is necessary "to construct a scale of graded similarity among meaningful objects of the same category, and then to find out what relation there exists between each unit of the scale and ability to recognize under such conditions of attention, perception and judgment as most prevail in actual life." But the determination of the relation between similarity and recognition is not necessary for a scientific guide nor does Feingold show that it is. This determination is a very complicated affair, and will therefore have to be considered in detail.

Feingold first proceeds to develop the Correction Formula on the basis that between similarity and recognition there is a simple inverse relation in terms of percentage as $X : (100 - X)$,—a relation which as shown in the second preceding paragraph does not hold. As the inverse relation is the very thing the formula is to effect, besides being a guide for the courts, it evidently cannot obtain support from it. The formula requires in application much calculation, but changes the score generally only a little. It is not possible to analyze the errors in it as he tries to do.

There is still another fault to be found with Feingold's formula, and it is a most important one as it may have a serious effect on

⁴⁵ See Tables 16, 20, 25, 29, *ibid.*, pp. 71, 73, 78, 83; and Plate II., p. 84.

practical affairs. His formula does not only so change his recognition results as to produce the simple inverse relation between similarity and recognition, and so make them ideal, but it makes many of them still less nearly ideal than if they had been uncorrected. In his Table 8, out of 6 degrees of similarity, 4 are made less ideal and 2 are unaltered. In other tables, many scores are also unaltered by the formula, and some are altered only very slightly in the ideal direction. His Correction Formula is therefore inaccurate and impractical.

In order to establish a relation between degree of similarity and recognition, Feingold thinks⁴⁶ it is necessary to find those conditions which, with the greatest number of items exposed for the shortest possible time would give 100 per cent. of discriminations of a new item of 0 per cent. similarity, and 100 per cent. of correct identifications of a duplicate item of 100 per cent. similarity. These are called ideal conditions and their attainment would give ideal results. The errors of duplicates and new items seem to be due either to the number of words exposed, or to the length of exposure, or to both.⁴⁷ Tho these errors are said not to distort the general results, they obscure the exact or ideal relation between the recognition of the various degrees of similarity.⁴⁸

It was his object to find that combination of length of exposure and number of objects exposed which would give such ideal conditions and results.⁴⁹ Throughout the entire investigation these conditions were never obtained exactly, but he devised a Correction Formula⁵⁰ which he says changes the results to what they would have been, if the conditions had been ideal. By eliminating the chance correct and chance incorrect recognitions from all the recognitions and thus separating those recognitions (correct and incorrect) due to similarity, the formula is intended to find the exact relation of degree of similarity to recognition. Tho the formula is based on experiments, it is not strictly empirical nor scientific, because when examined carefully the experimental results represented in the formula are found to rest on an unequal basis and to have unwarranted interpretations. This is the Correction Formula:⁵¹

⁴⁶ *Ibid.*, p. 35.

⁴⁷ *Ibid.*, p. 64 he says a "definite mathematical relation."

⁴⁸ *Ibid.*, p. 24.

⁴⁹ *Ibid.*, pp. 35-36.

⁵⁰ *Ibid.*, pp. 38-40.

⁵¹ So as to make it more easily grasped here I have substituted for the alphabetical symbols the things Feingold means them to signify.

$$\left\{ \frac{\% \text{ Difference or } 100 \% -}{\% \text{ Similarity}} \right\} \times \left\{ \frac{\% \text{ Incorrect Identifications of a New Item}}{\% \text{ Similarity}} \right\} - \% \text{ Similarity} \\ \times \left\{ \frac{\text{Incorrect Discriminations of all Duplicate Items}}{\text{No. of Items Exposed}} \right\} \times \frac{\text{No. of Items Changed}}{\text{No. of Items Exposed}} = K.$$

To obtain the correct result this value (K) is added algebraically (with a + or — sign) to the percentage of correct recognitions of the variable item, the percentage of whose similarity is given in the formula.

The formula involves a number of assumptions that seem to be untenable and otherwise objectionable. In the first place the errors or chance recognitions of the duplicate and new items are carried over to the variables.⁵² The errors of the variables should undoubtedly be calculated from their own recognitions, and not be made to depend upon the errors of the duplicate and new items. The psychological bases of the errors or chance recognitions of the duplicate and new items are not entirely the same as those of the variables. The chance incorrect discriminations of the duplicates are transmuted into chance correct discriminations of the variables. The resort to guessing in the case of the chance incorrect discriminations of the duplicates is generally due to the forgetting of the first of the two duplicates and in the case of the chance correct discriminations of the variables to the forgetting of the dissimilar original. The chance incorrect identifications of the new items are also transmuted into chance incorrect identifications of the variables. The resort to guessing in the case of the chance incorrect identifications of the new items is due generally to the failure to note that the new did not appear in the presentation, and in the case of the variables to the failure to discriminate the variable from its original. Feingold, of course, considers that there is a difference between chance correct discriminations and correct discriminations of a variable and between chance incorrect identifications and incorrect identifications; the former in each case being the result of a guess, and the latter of a conscious reaction to objective dissimilarity. Furthermore, the errors of the duplicates and of the new items are not calculated on the same basis. The per cent. of chance incorrect identifications of the new items is computed from the errors made in connection with a single new item exposed in a test among 7 duplicates or in an old environment.⁵³ The per cent. of chance incorrect discriminations

⁵² *Ibid.*, pp. 23–24, 37.

⁵³ *Ibid.*, pp. 36, 38, the results of a number of such exposures are used, but in the illustration of the practical application on p. 124 only one is used.

of the duplicates, on the other hand, is computed from the average of the errors of all the 8 duplicates exposed in the test or of the entire old environment.⁵⁴ The discrimination of a single new item, being in a different environment, is made under a less favorable condition than the recognition of the duplicate which appeared in the same environment. To be comparable with the errors of the duplicates those of the new items should come from an entire group of 8 new items or from a new environment.

In the second place, owing to the fact that Feingold proceeds on the theory that "there is a simple inverse relation between degree of similarity and recognition,"⁵⁵ the errors of the duplicate and the new items enter in definite proportion in each degree of similarity of the variable. He is therefore arguing in a circle, for it is just the exact relation between similarity and recognition that the formula is to make, and therefore, cannot rest on that assumption. The relation is really not simple, tho it is, in general, inverse. Feingold's position includes the two additional assumptions that (1) chance correct discriminations of a variable item vary in direct proportion and that (2) chance incorrect identifications of a variable item vary in inverse proportion to its similarity.

Concerning chance correct discriminations of variables Feingold states:

"But we cannot say that the same amount of error [incorrect discriminations of duplicates] would enter into the judgments of change rendered for objects of less than 100 per cent. S. For such objects would possess a certain amount of dissimilarity which would have a tendency of its own to elicit the judgment 'change.' And in proportion as such objects were removed from 100 per cent. S, in that proportion would that inherent tendency increase, while the tendency to say 'change' on the basis of illusion or mere chance would diminish."⁵⁶

Reasoning in like fashion concerning chance incorrect identifications of variables, he says:

"For we have no right to assume that 9 per cent. [belonging to words of 0 per cent. S] of the substitutions of 87 per cent. S also escaped recognition owing to the conditions of the experiment, because such words contained a certain amount of identity—87 per cent.—which would have a tendency of its own to elicit the judgment 'the same.' Likewise with words of every value of S."⁵⁷

On the surface, Feingold's analysis is likely to seem true, but this is due to the apparently logical character of his explanation. With the higher degrees of similarity and the more incorrect identifica-

⁵⁴ *Ibid.*, pp. 37-38, 124.

⁵⁵ *Ibid.*, p. 37, and see pp. 23-24.

⁵⁶ *Ibid.*, p. 37.

⁵⁷ *Ibid.*, p. 38.

tions, there are fewer chance incorrect identifications, and vice versa, and with the higher degrees of similarity and the fewer correct discriminations, there are more chance correct discriminations, and vice versa. In other words, there is a proportionate decrease of chance incorrect identifications with an increase of incorrect identifications, and there is a proportionate decrease of chance correct discriminations with an increase of correct discriminations. Moreover, according to Feingold's position there can be no chance correct discriminations of new items of 0 per cent. similarity, nor can there be any chance correct identifications of a duplicate item of 100 per cent. similarity; and this is implied, whether or not there are any errors of the duplicate and new items. The assumptions are evidently false. If, in the experiment, there were no chance incorrect discriminations of the duplicates, the formula would not serve to correct chance correct discriminations of the variables; and if there were no chance incorrect identifications of the new items, the formula would not correct for chance incorrect identifications of the variables.

The first step in the formula takes it for granted that similarity and difference are inversely related precisely, *i. e.*, when the similarity is 0 per cent. the difference is 100 per cent., and vice versa; and when the similarity is 25 per cent. the difference is 75 per cent., and vice versa. Table 8^{ss} of Feingold's monograph does not show this to be true; it would hold perhaps if there were a simple inverse relation between similarity and recognition. The inverse relation between similarity and difference, and similarity and recognition is also disturbed by the fact that Feingold himself finds no confusion below 20 per cent. or 25 per cent. similarity.

The criticism, in brief, of the Correction Formula is that it is based on false psychology, that it is unscientific, inaccurate, and impractical. Its practical outcome is quite negligible. In the closing chapter on The Application of the Laws of Recognition to Jurisprudence, Feingold illustrates the application of the recognition method and the formula in the court room. Tho the experiment is adjusted for ideal conditions, a few errors among the duplicate and new items cause Feingold to say, "Now apparently either the conditions of the experiments were not ideal or some of the observers were not absolutely normal, . . ."^{ss} The Correction Formula is then applied to obtain the ideal results. The uncorrected score is 42 per cent. of correct discriminations of the imitation; the formula shows that the amount of correction should be + 0.5; and according to

^{ss} *Ibid.*, p. 36.

^{ss} *Ibid.*, p. 125.

Feingold's computation 42.5 per cent. of correct discriminations is the ideal result. He has spent a vast amount of labor to develop the formula which yields the insignificant change of ± 0.5 . The erroneous assumptions on which the formula rests and the results obtained by it prove it to be useless.

It would certainly be unfair to judge all of Feingold's work by the Correction Formula. His experimental technique presents a good study in method. Moreover, some of the conclusions that we first mentioned will be found to be of decided psychological interest and others to have a direct practical bearing on various trade-mark problems.

To devise a scientific guide for the courts it is not necessary to establish a relation between recognition and similarity. Nor is it possible, as Feingold has attempted to do, to analyze completely the intricate errors of memory. A scale of confusion including a sufficient number of individuals to overcome such errors would be all that is necessary. In other words, it is not necessary nor is it possible at the present time, to arrive at a final conclusion regarding confusion, thru a synthesis of the many factors which comprise confusion. But it is possible to measure directly the amount of confusion involved. And this is just what we have done here as distinguished from what Feingold attempted to do.

CHAPTER II

MATERIAL EMPLOYED AND EXPERIMENTAL PROCEDURE

1. MATERIAL EMPLOYED

THIS chapter describes the trade-marks used and the manner of conducting the experiments. Sixty pairs of litigated trade-marks, all word trade-marks, were picked at random from a large number of court decisions. The 120 were all employed in the experiments; no trade-marks consisting of or including emblems, designs, symbols, or devices were used. Sixty of these trade-marks were originals, and the other 60 their respective imitations, which had become the subject of litigation. The collection represented many varying degrees of deceptive similarity, from a slight resemblance to approximate identity. The judicial decisions involving these 60 pairs of trade-marks were not wholly confined to questions of deceptive similarity between the word trade-marks, and hence are not homogeneous. Some of the judicial decisions were confined simply to questions of the deceptive similarity in law of mere word trade-marks, while others were complicated by the presence of various other questions. About one half of the decisions are adjudications of infringement, restraining the use of the imitative trade-marks, while the other half are adjudications of non-infringement, permitting the use of the imitation. The results of the experiments with these 60 pairs of trade-marks are given in Chapters III. and IV.

A second selection of trade-marks was made from other than litigated cases. In this selection there are 180 trade-marks. They were chosen at random from advertisements in current magazines, trade-journals, newspapers, etc. For experimental purposes 60 of the trade-marks were selected from the 180 and duplicates of them were made. We shall refer to both members of each pair as duplicates or duplicate trade-marks. The remaining 120 trade-marks are called new trade-marks.

All the trade-marks used in the experiment were shown with the commercial names of the articles or commodities to which they are applied in commerce, thus Green River Whiskey. The articles represented many classes of goods of various descriptive properties, for example, soap, shoes, flour, incandescent lights, tobacco, and oil. In some of the court decisions, however, the litigated pairs of trade-

marks are applied to different articles, whose commercial names are not identical, tho belonging to the same class of goods. The name of the article of the original trade-mark is identical with that of its respective imitation. In a few of the decisions with which Chapters III. and IV. are concerned, the names of the articles were not identical, but were made so in the experiment. Likewise, the name of the article in each pair of duplicate trade-marks is identical. In each set¹ the names of the articles of the original and imitative trade-marks are all different from the names of the articles of any of the duplicate or new trade-marks; and the names of the articles of the new trade-marks are all different from those of the duplicates.

2. EXPERIMENTAL PROCEDURE

(a) *General Description of the Recognition Experiments.*—Two different psychological methods were used to measure confusion, the recognition method² and the order of merit or relative position method. In Chapter II. there was three variations of the recognition method, a different group of observers being used for each variation. In the Uninformed group, the observers recognized the trade-marks without knowing that the imitations were to appear; in the Informed group, the observers were aware of this; and in the Control group, the recognitive value of the originals themselves was studied. In each group, there were 20 observers, 10 of each sex, all university students. Thus these results are based on the mental processes of well educated persons. In Chapter V., where only the Uninformed group was used, 40 observers were included in the experiment. Thirty-four were men and 6 were women, representing 28 different occupations and professions. Their ages ran from 16 years to about 65.

The 60 originals and the 60 imitations, the 60 pairs of duplicates, and the remaining 120 trade-marks were distributed in six sets. Each set consisted of two parts, the presentation which included the trade-marks first shown the observer, and the test which included the trade-marks shown later, to be recognized by the observer. The presentation contained 20 trade-marks, 10 originals, and 10 old or duplicate trade-marks. The test, on the other hand, contained 40 trade-marks, 10 imitations of the 10 originals shown in the presentation, 10 duplicate trade-marks of the remaining 10 shown in the presentation, and 20 new trade-marks, *i. e.*, trade-marks that had not been shown in the presentation. There were then four classes

¹ The sets are described on pp. 26-27.

² For a brief account of the form of this test and of others see H. L. Hollingworth, "Vocational Psychology," 1916, 109-121.

of trade-marks employed,—the originals, the imitations, the duplicates, and the new. In all the six sets there were no other trade-marks that were identical with the 60 originals, the 60 imitations, the 60 pairs of duplicates, or the 120 new trade-marks. This was so only in the Uninformed and Informed experiments, but not in the Control experiment where the imitations were omitted and duplicates of the originals replaced them. Unless otherwise specified in this study the words trade-mark, original, imitation, duplicate, and new, alone or in connection with the word trade-mark, signify the trade-mark itself plus the name of its article.

The six sets of trade-marks were tried in one sitting, the presentation of each successive set following immediately after the test of the preceding one. The task was not laborious, and the entire experiment did not usually require over twenty-five minutes. Very few complaints were made in the introspections to indicate that the observer thought himself confused by having gone thru the previous sets. The order in which the six sets were given varied so that the possible effects of practice and fatigue might be equally distributed among them. At the close of the experiment, the question was asked "How did you react when the words were shown to you in the presentation and in the test?" It was found that in the presentation that the subject had as a rule been able only to read the words. In Chapter V. only one set of trade-marks was studied.

The trade-marks and the names of the articles were all type-written in black ink on small slips of white paper, two and three quarters by four and one quarter inches in size. The name of the article appeared on the line directly beneath the trade-mark. Care was taken to keep the blackness of the ink the same for all the letters in the words. All the words appeared in the second horizontal quarter from the top of the slip of paper. The arrangement of the words on an original and its respective imitation slip is shown below.

Original	Imitation
<div data-bbox="280 1345 404 1408">Holeproof Hosiery</div>	<div data-bbox="736 1345 835 1408">Knotair Hosiery</div>

The following directions were given to each observer in the Uninformed and Informed groups:

"You are going to be shown, one at a time, on slips of paper, a number of

ordinary word trade-marks and the names of their articles, as 'Uneeda Biscuit,' 'Garford Automobile,' and 'Standard Oil.' You are to read all the words on each slip of paper. Read them naturally as though you were reading an advertisement in a magazine or in a street car. Immediately after you have been shown the last slip, you will be given a second list (the test) and asked to pick out those slips that you have just seen in the presentation and those you have not seen. You will be asked further to sort the slips into seven piles, according to the degree of your confidence or certainty of recognition of the slips. There are three degrees of certainty for the slips that are recognized as seen, and three similar degrees for those that are recognized as not seen. The three degrees are 'absolutely certain,' 'reasonably certain,' and 'faint idea.' In the seventh are put the guesses or doubtful recognitions, those slips that cannot be recognized as seen or not seen."

There were not many doubtful recognitions, as the observer was asked in each case to force a decision one way or the other.

The experimenter placed one slip on top of the other on the table before the observer. The slips in the presentation were shown at the uniform rate of one a second. The exposure gave the observer just time to read all the words on the slip. In the test he took his own time in recognizing the slips. As the slips in both the presentation and the test were thoroughly shuffled after each observer did the experiment, no slip was given undue prominence by its position in the list. The general technique of the recognition method, as described above, is similar to that employed by Strong, Hollingworth,² and others.

The confusion caused by the imitations could have been studied with the duplicate and new trade-marks altogether omitted from the experiment. They were included, however, to make the experimental conditions more comparable to situations in everyday life. The duplicates were included in the test to make part of its setting identical with that of the presentation; whereas the new trade-marks were included to introduce a difference. In everyday life, if an imitation is met with in a store, its setting, surroundings, or environment (composed partly of the same and other kinds of goods, and of store fixtures), are in part new, in part identical with, or similar to that in the store in which the original was first seen. Furthermore, the various circumstances under which the original is met with may contribute to magnify the difference between its setting and that in which the imitation appears at a purchase. It may have been that the original was seen in a magazine or newspaper advertisement, or on a card in a street, elevated, or subway car, or on some poster, or that it was orally recommended by a friend. No

² "Characteristic Differences between Recall and Recognition," *Amer. J. of Psychol.*, 1913, 24, 535.

attempt, however, is made to reproduce in the experiments the multitudinous variations that occur in everyday life.

(b) *Uninformed Experiment.*—The observers in the Uninformed group were not told of the purpose of the experiment; nor that there would be any imitations in the test replacing some trade-marks shown in the presentation. In daily life the circumstances under which a trade-mark is first met with and later recognized often resemble conditions similar to those of incidental memory.⁴ If the observer inquired whether all the trade-marks shown in the presentation were in the test, or whether there were imitations in the test replacing some trade-marks in the presentation, he was told that these questions could not be answered until after the experiment was over. Nothing was said or done by the experimenter to lead the observer to suspect that there were imitations in the test and that their originals were omitted. Yet, if the observer said "here is a slip on which the trade-mark is different, but the name of the article is the same as that which was seen the first time in the presentation," and that he did not know whether it was correct to say he had seen the slip, he was told that if all the words on the slip were exactly the same as those seen before he should say that he had seen it, if all the words on the slip were not exactly the same he should say that he had not seen it. Even those observers who showed by their remarks or behavior that they noticed a catch in the experiment and were consequently on the alert against being deceived, were nevertheless later often deceived.

(c) *Informed Experiment.*—In addition to the directions given in the Uninformed experiment the Informed observers were told of the purpose of the experiment. They were informed that they were going to be shown 20 trade-marks and the names of their articles in the presentation, and that in the test there would be 40, 10 identical with 10 shown in the presentation, 10 imitations, and 20 new. Besides picking out the slips that were the same as those in the presentation and those that were new, they were asked also to pick out those that were changed. Their knowledge and caution against imitations were of course much greater than in the case of the Uninformed group.

(d) *Control Experiment.*—The directions in the Control experiment were the same as in the Uninformed, but the formation of the test was different. The purpose of this experiment was to study the recognitive value of the originals and to determine how well the

⁴In this connection G. C. Myer's monograph gives some interesting results of the inaccuracy of knowledge of familiar objects and events, "A Study in Incidental Memory," *Arch. of Psychol.*, 1913, No. 26.

duplicates and new trade-marks could be recognized when no imitations appeared. In the Control there were no imitations in the test, but the 10 originals of the presentation reappeared in the test. The test then contained duplicates of 10 of the originals, the usual old or duplicate trade-marks, and the 20 new. All the duplicates and new trade-marks were the same as those in the Uninformed and Informed experiments.

(e) *Relative Position Experiment*.—This experiment measures confusion differently from the recognition experiments. It does not state "how many" individuals are confused by the imitations, but it does give a measure of their relative differences. The degree of confusion between any pair of trade-marks is then measured by its position in the list. There are two forms of relative position experiment, the *serial*, and the *group*.⁵ Both are used in this study; the group form in Chapter IV., and the serial in Chapter V. The directions for the group form required the observer to arrange 50 pairs of trade-marks in an order according to their likelihood of confusion. This he was to do by considering the deceptive similarity in visual appearance, sound, and meaning of the trade-mark. There were 11 grades into which each pair could be sorted, the limiting ones being 0 representing absolute non-confusion and 10 absolute confusion.

The observer may assign any pair of trade-marks to any one of these grades. If he thinks for example that there is no possibility of confusion between the imitation "Black Diamond" and the original "Syphon" when applied to refrigerators he grades it 0; and if there seems to be absolute likelihood of confusion between another pair he grades it 10.⁶ If the pair of trade-marks "Shipmate—Messmate" seems to be midway between absolute non-confusion and absolute confusion the observer grades it 5. Again, if a pair of trade-marks seems to have just the least likelihood of confusion it is put in pile 1. It is not believed that all the observers judged the trade-marks in the above manner.

⁵ The group form is a modification of the serial, and either may be quickly transformed into the other. Hollingworth, who introduced the group form, finds that its results correlate closely with the serial. It has the advantages of being quicker, less fatiguing and monotonous, and permitting the observation of any changes in value of all the items, advantages which cannot be obtained by the serial. "Judgments of the Comic," *Psychol. Rev.*, 1911, 18, 135-136.

⁶ There appears to be a discrepancy here in the fact that on the basis of pure chance alone one can distinguish an imitation that is identical with its original in 50 per cent. of the cases. It should also be said that both these limits cannot be held to be strictly absolute.

Each observer was given an envelope and a sheet of directions. Enclosed in the envelope were 50 slips of white paper, containing the 50 pairs of trade-marks and their articles. The directions were:

"Please arrange the enclosed slips in an order of merit according to the following directions.

"Each slip contains two trade-marks of a common article. The upper is the original trade-mark and the lower is the imitation of it.

"The different pairs of trade-marks on the different slips vary in their likelihood of confusion, or in their deceptive similarity, or in the likelihood that the imitation trade-mark will be mistaken for the original. This confusion may be due to the appearance of the trade-marks, their sound, their meaning or significance, or any combination of these three factors.⁷

"Arrange the slips according to their likelihood of confusion as follows: Put in the grade marked 0 those slips whose trade-marks would cause *absolute non-confusion*. Put in grade 1 those which would cause the least amount of confusion, in grade 2 those which would cause a little more confusion, in grade 3 those which would cause still more confusion, and so on up to grade 10 which represents *absolute confusion*. The intervals between the grades are all equal.

"It is not required that an equal number of slips be put in each grade, nor that every grade be used.

"In arranging the slips consider each trade-mark as if you have had no previous experience with it.

"Finally, it must be remembered that the name of the article forms no part of the trade-mark."

In addition the observer was told that there was no time limit, and that he could take as long as he wished to make the arrangement. He was allowed to rearrange the order until it satisfied him. When the observer indicated that he was satisfied with his arrangement, he was asked to state how he did it.

Fifty college students, 25 men and 25 women, acted as judges. They were students of psychology at Columbia University during the fall of 1914. No observer in this experiment took part in the others.

By stating in the directions that the intervals between the grades are all equal the intention was to answer in advance any question in this regard, and to give the impression that they were not to be considered unequal. Yet it is not believed that the observer in grading always considered the differences between the grades equal, nor that he could always be so exact in making his judgments. Thus it cannot be maintained that the same amount of difference between the average grades of two pairs of trade-marks in two different regions of the scale stand for equal objective differences in deceptive similarity. In spite of all this, the inclusion of the above state-

⁷ Another factor that might have been included is similarity in linguistic formation.

ment in the directions is perhaps justified because it may have acted as a mild persuasion to the observer to try to do this. It would tend to make the results more reliable.

Thirty-nine of the 50 pairs of trade-marks were litigated and were employed also in the recognition experiments. The remaining 11 pairs of trade-marks were uncontested and artificial, being coupled by the experimenter. Three of the 11 pairs were purposely made very dissimilar, 5 representing random ratings, and 3 identical matings. None of the 11 pairs were studied in the recognition experiments. The artificial matings were included among the litigated trade-marks for several reasons. We wanted to know what the grades of the dissimilar, random, and identical matings would be, and how they would compare with the grades of the litigated trade-marks. It was thought that the artificial matings would give a more clear and definite meaning to the limits of the series. In some cases they would tend to prevent a piling up at the limits, and in others to fill out the range between the limits.

All the trade-marks appeared with the names of the articles, the name of the article of the original trade-mark being identical with that of its imitation. With the exception of the dissimilar and random matings, the names of the articles were the same as those to which they were applied in commerce. In these cases the name of the article applied to the trade-mark in each pair was in fact used in connection with one of them in commerce.

In preparing the material the same precautions and care were taken as in the recognition experiments. On each of the 50 slips of white paper, two and three-quarters by four and one quarter inches in size, appeared the imitation and original trade-marks, each with the name of its article. The original trade-mark and the name of its article directly beneath appeared in the second horizontal quarter from the top of the slip; the imitation and the name of its article in the third horizontal quarter. The words were arranged on the slips as shown below.

Royal Irish Linen
Writing Paper

Royal Vellum
Writing Paper

The serial form of the relative position method used in Chapter V. differs from the group form in that it permits the trade-marks to be graded without any gaps between them in an unbroken continuum. In this experiments there were 9 pairs of litigated trade-marks picked at random from simple decisions. They were studied also by the recognition method. Their results test, as has been mentioned before, the accuracy of the judicial decisions. The departure from the instructions in the group form will be observed.

"Please arrange as well as you can the enclosed slips in an order according to the following instructions.

"Each slip contains two trade-marks of a common article. The upper is the original trade-mark and the lower is the imitation of it.

"The different pairs of trade-marks on the different slips vary in their likelihood of confusion, or in their deceptive similarity, or in the probability that the imitation trade-mark will be mistaken for the original. *This confusion may be due to the appearance of the trade-marks, their sound, their linguistic formation, their meaning or significance, or any combination of these four.*

"Arrange the slips serially according to their likelihood of confusion as follows: Put on the top of the pile the slip whose trade-marks show the greatest likelihood of confusion and on the bottom the slip whose trade-marks show the least likelihood of confusion. Between the top slip and the bottom slip put those slips whose trade-marks show intervening degrees of likelihood of confusion.

"In arranging the slips consider the trade-mark as if you have had no previous experience with it."

Forty college students, 20 men and 20 women, acted as judges. They were students of psychology at Columbia University in the spring of 1915. Their ages were fairly uniform, varying only within a few years of each other.

At the hands of Fechner, Galton, Cattell, Thorndike, Hollingworth, Strong, and others the relative position method has yielded various scientific and practical investigations of great importance.⁸

⁸ For a more complete account of the technique of measurements by relative position and of mental scales see E. L. Thorndike, "Mental and Social Measurements," 1913, 7-26; R. S. Woodworth, mimeographed lecture notes on *Judgment*, 1917, 3-6, 16-20; and H. L. Hollingworth, *The Method of Relative Position*, "Psychological Researches of J. McK. Cattell," *Archives of Psychol.*, 1914, No. 30, 75-91.

CHAPTER III

RESULTS OF THE RECOGNITION EXPERIMENTS

1. AVERAGE RESULTS

THE first section of this chapter deals mainly with the psychological aspect of recognition, and the following sections with the practical side. We shall begin by examining the extent to which the imitations were confused when the observers were not told about them. It will be remembered that in each test there appeared 10 imitations, the originals having previously appeared in the presentation. Tho the imitative trade-mark itself was in every instance different from the original trade-mark, the name of the commodity was identical in both connections. In the Uninformed experiment a recognition of an imitation is scored correct if it is discriminated and placed in one of the "not seen" piles; in the Informed experiment it is scored correct if placed in one of the "changed" piles. In the Uninformed experiment an imitation is scored incorrect if identified and placed in one of the "seen" piles.¹ This score represents the percentage of confusion (or mistaken recognitions) between the originals and the imitations. In the Informed experiment an imitation is scored incorrect if it is discriminated and placed in one of the "new" piles, or if identified and placed in one of the "identical" piles. The identifications represent the percentage of confusion between the originals and the imitations. Then the "seen" pile in the Uninformed and the "identical" in the Informed are comparable in respect to confusion.

TABLE I.

THE AVERAGE PER CENT. AND PROBABLE ERROR OF INCORRECT IDENTIFICATIONS OF
THE *Imitative* TRADE-MARKS
Uninformed Subjects

Number	Trade-Marks	Kind	Av. Per Cent. Confused	P. E.
60		Imitative	44	1.5

¹ The discriminations in the Uninformed group represents three kinds of recognitions, (1) the imitations recognized as somewhat altered or changed, (2) a recognition of no similarity or difference in the imitation, and (3) the imitation recognized as entirely new, the original having been forgotten. In the Informed the discriminations represent only the two latter kinds of recognitions. In the results, however, these are all massed together.

(a) *Uninformed Experiment.*—Table I. presents the results of the imitative trade-marks in the case of the Uninformed group of subjects. The first column in the table states the number of trade-marks studied, and the second the kind of trade-mark, i. e., whether imitative, duplicate, or new. The third column shows the average per cent. of incorrect identifications or the average per cent. of times the imitative trade-marks were confused with their respective originals. The fourth column gives the probable error of the average.

Forty-four per cent. of the imitative trade-marks were incorrectly identified, i. e., were indicated as having been seen before in the presentation. The probable error of this average, 44 per cent., is 1.5, the chances being even that the true average (obtained from an infinite number of subjects) lies between 42.5 and 45.5, or outside it. The average of 44 per cent. has then a high degree of validity. If all the imitative trade-marks had been discriminated by every subject, or indicated as not having been seen before, all the recognitions would have been scored correct and the average per cent. of incorrect identifications would have been 0. But if, on the other hand, all the imitations had been confused with their respective originals, the average per cent. of incorrect identifications would have been 100. The difference between 44 per cent. and the greatest possible score of confusion 100 per cent. gives 56 per cent., the average per cent. of correct discriminations. The average per cent. 56 is 12 per cent. or about 1.3 times greater than the average per cent. 44 of incorrect identifications. In other words there are about one fourth more imitations correctly discriminated than confused.

Pure chance, involving no question of memory at all, would give about 50 per cent. correct and 50 per cent. incorrect recognitions. Altho the percentages of correct and incorrect recognitions of Table I. are 6 per cent. away from what pure chance would give, they should not be considered as influenced by chance to this large extent. That this is discredited is apparent from an examination of the individual scores of the imitative trade-marks;² those possessing greater similarity in form and meaning receiving higher scores of confusion, and vice versa. If chance were so greatly active in producing the average 44 per cent., the imitative trade-marks of high similarity would have about an equal number of high and low scores of confusion. The data from the duplicate and new trade-marks would likewise be affected so as to result in scores close to 50 per cent. correct and 50 per cent. incorrect recognitions. On the con-

² See Table IV., pp. 39-41.

trary, they both possess much higher scores.³ Thus in the case of the imitations chance would not necessarily be the cause of a result of 50 per cent. correct and 50 per cent. incorrect recognitions. It is not denied that some of the individual scores were influenced by guessing and chance, but it is denied that the average 44 per cent. has been influenced to such an extent that it is only 6 per cent. different from what pure chance would give.

TABLE II

THE AVERAGE PER CENTS. AND PROBABLE ERRORS OF THE IMITATIVE TRADE-MARKS
RECOGNIZED AS IDENTICAL, CHANGED AND NEW

Trade-Marks		<i>Informed Subjects</i>					
Number	Kind	Identical	(P. E.)	Av. Per Cent. Recognised as Changed	(P. E.)	New	(P. E.)
60	Imitative	23	1.4	51	1.4	26	1.0

(b) *Informed Experiment.*—These observers were aware of the presence of the imitations, and had to recognize in addition to those trade-marks they had seen and had not seen, those that were changed. Table II. presents the recognitions of the imitative trade-marks in the Informed groups. The first column in the table states the number of trade-marks studied, and the second the kind of trade-mark. The third column shows the average per cent. of incorrect recognitions, identifying the imitations with the original trade-marks. The fifth column shows the average per cent. of correct recognitions, noting a change of the imitation from the original. The seventh column shows the average per cent. of incorrect discriminations of the imitations or those imitations recognized as new. Columns 4, 6, and 8 give respectively the probable errors of the averages in columns 3, 5, and 7.

Column 3 shows that on an average 23 per cent. were confused or incorrectly identified as having been seen exactly the same in the presentation. Column 5 shows that on an average 51 per cent. of the imitations were correctly recognized as changed from the form in which they appeared in the presentation.⁴ Finally, column 7

³ The duplicates have 73 per cent. correct identifications and the new trade-marks 93 per cent. correct discriminations.

⁴ The phrase a "correct recognition of change" is used in connection with the imitations and originals to denote not a single absolutely correct kind of recognition, but rather a variety in recognitions of change as well as degrees of accuracy. In some cases a recognition of change may indicate that the original is completely recalled with the correct noting of all things changed in the imitation. In other cases it may represent just a bare feeling that the imitation is different from some trade-mark seen before in a presentation. In still other

gives the average per cent. (26) of incorrect discriminations, i. e., of the failure to recognize the imitations as resembling some trade-marks seen in the previous presentation. The average per cent. (51) of correct recognitions of change is about 2.2 times greater than the average per cent. (23) of incorrect identifications, and about 2.0 times greater than the average per cent. (26) of incorrect discriminations, which is about 1.1 times greater than the average per cent. of incorrect identifications. The last difference is not large.

It might well be asked now which is the more typical method in everyday life and which is the better psychologically, the Uninformed or the Informed. In everyday life we find each of these methods and a combination of the two; the corresponding kinds of recognition described under our experimental conditions also occurring. The Informed method is perhaps from the psychological point of view the better, as it gives us more information concerning the subject's performance than the Uninformed. A court of equity would most likely favor an experiment conducted under the Uninformed conditions, as it generally considers that the ordinary purchaser in daily life to be similarly unwary.

TABLE III

THE AVERAGE PER CENT. AND PROBABLE ERROR OF CORRECT IDENTIFICATIONS OF THE *Original* TRADE-MARKS

<i>Control Subjects</i>			
Number	Trade-Marks Kind	Av. Per Cent. of Correct Identifications	P. E.
60	Original	84	.9

(c) *Control Experiment*.—Whether there is or is not confusion in the preceding recognition experiments depends upon two factors, the degree of deceptive similarity of the imitation and the memory of the original. At first it was thought that by determining the recognitive value of the originals it would be possible to assign an exact value to each of these factors. It was seen later, however, that such an analysis could not be made. The Control experiment was not in fact a control, for we did not keep the deceptive similarity constant while measuring at the same time the memory of the

cases it may represent a noting of incorrect changes in the imitation, as a result of an incorrect recalling of the original, an incorrect comparison of the imitation and the original, or both. The recognitions of change described in the above cases with the numerous possible variations give one an idea of the different degrees of accuracy. The data at hand do not enable one, however, to distinguish these degrees. The recognitions are still more complicated by the rôle played by the name of the article in aiding or thwarting recognition.

original. Under the conditions observed with the experiments with the imitations both these factors usually cooperated. Tho our primary object failed, a few definite results were obtained. The Control did determine the degree to which the original could be identified under conditions comparable with those in the Uninformed and Informed experiments. In the two latter experiments the 10 originals appeared in the presentation, but their imitation replaced them in the test. No imitations appeared in the Control; the 10 originals appeared in the presentation and in the test.

Table III. presents the results of the original trade-marks obtained in the Control group. The first column states the number of trade-marks obtained in the Control group. The first column states the number of trade-marks studied, and the second the kind of trade-mark. The third column shows that the average per cent. of correct identifications is 84, and the fourth column that its probable error is 0.9. The difference (16) between per cents. 84 and 100 gives the average per cent. of incorrect discriminations, or the average per cent. of originals that were recognized as not seen in the presentation, where in fact they did appear. The average per cent. (84) of correct identifications is 68 per cent. or about 5.3 times greater than the average per cent. (16) of incorrect discriminations.

2. RESULTS FOR THE SEPARATE TRADE-MARKS

This section deals with the individual scores of the originals and imitations, whose averages were reported in the preceding section. About half of the imitations were declared to be illegal and the other half legal. But as was mentioned not all the decisions represented by the trade-marks in this chapter and Chapter IV. were rendered merely on the question of deceptive similarity of the word trade-marks; in many of them other legal questions were taken into account. For this reason all the scores cannot be taken as a measure of the accuracy of the decisions. But we have mentioned them because they seem to throw light on other legal and psychological matters.

Table IV. presents the separate scores of the 60 original and imitative trade-marks for the Uninformed, Informed, and Control groups. The first column in the table shows whether the imitation in the decision was held to be an infringement (I) or a non-infringement (N). When the letters I and N are printed in ordinary type the decisions are generally of simple cases. But when the letters *I* and *N* are printed in italics the decisions are of complicated or questionable cases, involving other things besides the point of de-

TABLE IV

THE ORIGINAL TRADE-MARK, THE IMITATIVE, THE NAME OF THE ARTICLE, THE ORDER, AND THE RECOGNITION SCORES IN THE UNINFORMED, THE INFORMED, AND THE CONTROL GROUPS

Decision	Original	Trade-Mark	Imitative; Welcome A. Smith	Name of Article	Uninformed		Groups Informed		Control Per Cent. of Cor- rect Identifica- tion of Orig- inal
					Order	Per Cent. Confirmed	Identical	Per Cent. Recognised As:	
I	Welcome		Welcome A. Smith	Soap	1	5	80	20	85
I	Our Little Samson		Samsoncalf	Shoes	2	10	50	50	75
N	Golden Charm		Charm	Flour	3	10	5	50	45
N	Walkeasy		Waukwell	Shoes	4	10	100		80
N	Holeproof		Knotair	Hosiery	5	10	10	80	10
I	Rubberset		Rubber-rule	Shaving Brush	6	20	75	25	80
N	Keepclean		Sta-Kleen	Toilet Brushes	7	20	5	70	25
I	Yusea		U-C-A	Incandescent Lights	8	20	10	70	20
N	Every Day		Everybody's	Soap	9	20	20	70	10
N	Union Leader		Union World	Tobacco	10	30	5	60	35
I	Kalamazoo Wagon		Kalamazoo Buggy	Company	11	30	10	60	30
N	No-To-Bac		Baco-Curo	Medicine	12	30	15	55	30
N	Don Carlos		Don Caesar	Olives	13	30	15	60	25
N	Royal Irish Linen		Royal Vellum	Writing Paper	14	30	15	65	20
I	Uno		Ino	Medicine	15	30	20	60	20
I	Liveraid ¹		Liverine	Medicine	16	30	30	50	20
I	Beats-All		Knoxall	Lead Pencil	17	35	65	35	95
N	S. B.		B. & S.	Cough Drops	18	35	30	70	80

¹ Through error these words were spelled, and used in the experiments, slightly different from the way in which they occur in the court records: Liveraid should be Liveroid, Seafoam should be Sea Foam, and Mormaja should be Monaja.

TABLE IV (Continued)

	Original	Trade-Marks	Imitative	Name of Article	Uninformed		Groups Informed		Control Per Cent. of Copies of Original
					Order	Per Cent. Continued	Per Cent. As:	Per Cent. Recognized	
							Identical	Changed	New
N	Maraschino	Marceno		Candy	19	35	45	35	20
I	Pep-Kola	Pepko		Tonic	20	35	40	45	15
N	Ruberoid	RubberO		Roofing	21	40	10	60	30
I	Shipmate	Messmate		Galley Stove	22	40	15	50	35
N	Pratt's Astral	Standard White Astral		Oil	23	40	20	50	30
I	Worth	Our Worth		Edge Tools	24.5	40	20	55	25
N	Besteyette	Veribest		Raincoat	24.5	40	20	55	25
I	Sorois	Sartoris		Shoes	26	45	5	70	25
N	Sozodent	Kalodent		Tooth Paste	27	45	5	80	15
I	Cyco	Cyco Prize		Carpet Sweeper	28	45	10	55	35
N	Ma-Le-Na	Man-e-lin		Medicine	29	45	15	60	25
N	Old Country	Our Country		Soap	30	45	20	40	40
I	Six Little	Six Big		Tailors	31	45	30	55	25
N	Dermacura	Dermakola		Skin Ointment	32	45	30	25	45
I	Maizena	Maizharina		Corn Flour	33.5	45	30	40	30
N	Bear Lithia Springs	Great Bear Springs		Company	33.5	45	30	40	30
I	Mellwood	Mill Wood		Whiskey	35	45	30	45	25
I	Seafoam ¹	Sodafoam		Baking Flour	36	45	35	50	15
N	Magic	Magico		Cleanser	37	45	40	30	30
I	Amber Bead	Amber		Beer	38	45	40	40	20
N	Victor	Victoria		Millinery	39	45	45	35	20
I	Capital	Capitol		Coffee	40	45	45	40	15

TABLE IV (Concluded)

Decision	Trade-Marks		Name of Article	Uninformed		Groups Informed		Control Per Cent. of Cor- rect Identifica- tion of Orig- inals	
	Original	Imitative		Per Cent. Confused	Per Cent. Recognised As:	Identical	Changed		
N	Electric	Electric Light	Flour	41	50		70	30	New
N	Eagle	Gold Eagle	White Lead	42			10	45	45
I	Green River	Green Ribbon	Whiskey	43			15	50	35
I	Carbolineum	Creo-Carbolin	Preserving Paint	44			20	30	50
N	Social Register, Newport	Newport Social Index	Directory	45			20	40	40
I	German Sweet	Sweet German	Chocolate	46			25	50	25
N	Henderson	Anderson	Whiskey	47			55	15	30
I	Mormajai	Mojava	Coffee	48			55	20	60
I	Nitro	Nitro-Hunter	Firearms	49			60	10	35
I	Grenadine	Grenade	Syrup	50			60	25	55
N	Muresco	Murafresco	Wall Covering	51			65	25	60
I	Trenton	Trenton Style	Pork Roll	52			65	55	10
I	Johnston's	Johnson's	Chocolates	53			65	75	15
I	Willoughby Lake	Willoughby Ridge	Sythe-Stones	54			70		50
N	West End	East Ridge	Distilling Co.	55			70	20	55
I	Cottolene	Cottoleo	Substitute for Lard	56			70	40	35
I	Dyspeptique	Dyspepticide	Medicine	57			75	35	60
I	Ceresota	Ceresota	Flour	58			80	25	65
N	Siphon	Siphon System	Refrigerator	59			80	50	30
I	Nubia	Nubias	Cigarettes	60			85	40	30

ceptive similarity of the word trade-marks, and hence are not suitable for testing the accuracy of the decisions. The second column in the table shows the original trade-mark, the third the imitative, and the fourth the name of the article which appeared with both the original and imitative trade-marks. Column 5 presents the trade-marks in the order of confusion, from least to most. Column 6 gives the percentage of individuals in the Uninformed group that confused the imitative trade-mark with the original. The seventh column gives the percentage of individuals in the Informed that confused the imitative trade-mark with the original; the eighth that recognized the imitation as changed; and the ninth that discriminated it. The tenth gives the percentage of correct identifications of the original trade-marks in the Control group.

The order of confusion in the fifth column is determined, first, by the amount of confusion shown in the Uninformed, and secondly, in case two or more pairs of trade-marks have equal scores, by the amount of confusion shown in the Informed. To obtain in the Informed a complete estimate of the amount of deceptive similarity it is necessary to take into account the three kinds of recognition. This was done by taking as the most confusing the pair of trade-marks that had most incorrect identifications; but if the incorrect identifications were equal here also, the pair which had most correct recognitions of change or the least discriminations was then taken as the most confusing. As the equating of these three values of deceptive similarity is not absolutely exact the second arrangement is a little rough and arbitrary. Nevertheless, the method in the main is sound. There are just two cases in which two pairs of trade-marks have identical scores in the Uninformed and in the Informed. The pairs of trade-marks in which the original trade-marks had a higher per cent. of correct identifications were put above the others.

One of the first things to be noticed about the table is that all imitations, non-infringements as well as infringements, cause some confusion in the Uninformed group. Furthermore, both in the Uninformed and Informed they do not divide into two groups, but extend over about three fourths of the entire length of the scale, forming a continuum. These two findings do not support the legal treatment of imitations. Indeed, they present clear proof against the statements made in trade-mark laws, judicial decisions, and legal textbooks which consider imitations as falling into only two discrete groups, those likely to deceive and those not likely to deceive. For legislative bodies and courts to think and work on false

principles and assumptions in regard to imitations has surely a detrimental effect not only on their own proceedings but also on business and commerce. Confusion, tho it be a subjective fact, is also a quantitative one. To handle it correctly it needs to be measured, not merely defined. In ordinary conversation we are usually satisfied in remarking that the weather is hot, warm, cool, etc. But in scientific and industrial laboratories these adjectives become exceedingly vague and are replaced by degrees on the thermometer. By standardizing our notions about degrees of heat, the thermometer permits of greater accuracy in working with them. Clear and quantitative meanings attached to the legal and illegal categories of deception would undoubtedly favor greater accuracy in handling them too.

Let us now see what the highest and lowest scores are for each kind of recognition. In the Uninformed "Nubia-Nubias" is the most confusing pair of trade-marks, deceiving 17 out of 20 individuals or 85 per cent. of the group. The least confusing pair is "Welcome—Welcome A. Smith" with a score of 5 per cent., deceiving only 1 out of 20 individuals. Column 7 shows that in the Informed group seven pairs of trade-marks have 0 per cent. scores of confusion. In the Uninformed one of these, "Welcome—Welcome A. Smith," has 5 per cent. of confusion and another, "Willoughby Lake—Willoughby Ridge," has 70 per cent. For the 0 per cent. scores in the Informed this is the largest difference between the confusion of any two in the Uninformed. "Johnston's—Johnson's" with 75 per cent. of confusion is the most confusing imitation in the Informed, it being eighth from the top in the Uninformed where its score is 65 per cent. This pair of trade-marks is one of the three which received a higher score of confusion in the Informed than in the Uninformed; these being the only cases where the natural results of more confusion in the Uninformed than in the Informed does not obtain. As the difference is not large in any of the three cases it is quite possible that further experimentation would reverse the advantage. It will be noticed that the scores of confusion in the Informed tend in general to increase with their corresponding ones in the Uninformed. In 52 cases out of 60 the confusion in the Uninformed is higher than in the Informed; and in 5 cases they are equal.

In the column for correct recognitions of change "Walkeasy—Waulkwell" has a 100 per cent. or perfect score, and "Trenton—Trenton Style" with 10 per cent. stands at the lower limit. The former in the Uninformed confused 10 per cent., and in the In-

formed 0 per cent.; the latter in the Uninformed confused 65 per cent., and in the Informed 55 per cent. An imitation that is easily detected is apt to cause little confusion, and vice versa. In the column for incorrect discriminations or those imitations recognized as new the highest score is 55 per cent., and the two lowest are each 0 per cent. Two scores at 60 per cent. are the lowest for correct identifications of the originals, and 4 perfect ones are the highest. The identifications of the originals are higher in correctness than any other kind of recognition. A comparison of the correct identifications of the originals with the incorrect identifications of the imitations shows that in all but two instances the originals were more often identified as originals than imitations are identified as originals. "Johnston's—Johnson's" in the Informed with 75 per cent. and "Willoughby Lake—Willoughby Ridge" in the Uninformed with 70 per cent. are the exceptions. These scores indicate that the imitations look just like the originals and under the experimental conditions are not distinguishable. Each of the 3 most confusing pairs of trade-marks in the Uninformed differ in percentage of identifications from that of their respective originals by only 5 per cent. We may see from these cases the extent to which an imitation may displace its original.

The scoring permitted a difference of no less than 5 per cent. The range in percentage of the various kinds of recognitions vary from 40 per cent. of the entire length of the scale (from 60 per cent. to 100 per cent. of correct identifications of the originals) to 90 per cent. of the entire length of the scale (from 10 per to 100 per cent. of correct recognitions of change of the imitations); or from four tenths of the entire range to nine tenths. In the different ranges there are only a few gaps between any two pairs of trade-marks, and those not very wide. If we had experimented further, or had used more trade-marks of other degrees of deceptive similarity, there is no doubt that all the missing steps would have been filled in. The frequencies of the different percentages of the various recognitions in the 3 groups tend, when plotted, to resemble the normal probability curve, excepting the incorrect identifications in the Informed which are skewed toward the high end.

3. SCALE OF CONFUSION IN RECOGNITION

Mental measurements and scales have been the subject of very fruitful inquiry in psychology, constituting also one of its most practical branches. In recent years mental scales or standard tests have shown a rapid development and a wide range of practical ap-

plication. They have been treated from various aspects by many psychologists. Galton, Cattell, Binet and Simon, Terman, Thorndike, Yerkes, and others have done much to place the subject on a scientific basis. There are now at least 29 mental scales in use, measuring such things as English, reading, spelling, handwriting, drawing, mathematics, teachers' efficiency, intelligence, and eminence. The chief value of these scales lies in their possessing greater accuracy in measuring mental traits than the more usual and more subjective methods.⁵ A psychological scale for the measurement of the amount of deceptive similarity between two trade-marks would also be a more accurate method for the determination of lawful and unlawful imitations than the present judicial procedure, but such a scale has not yet been made. Even if it were, it is likely that slowly progressive judicial opinion would not be quite ready to accept it. Nevertheless, it might be worth while to show by an example the manner of construction and the mode of application of such a scale.

SCALE I

SCALE OF VISUAL RECOGNITIVE CONFUSION OF TRADE-MARKS

Originals	Imitations	Confusion	
		Order	P. C.
Welcome	Welcome A. Smith	1	5
Golden Charm	Charm	2	10
Yusea	U-C-A	3	20
Royal Irish Linen	Royal Vellum	4	30
Beats-All	Knoxall	5	35
Shipmate	Messmate	6	40
Six Little	Six Big	7	45
Carbolineum	Creo-Carbolin	8	50
Mormaja	Mojava	9	55
Grenadine	Grenade	10	60
Muresco	Murafresco	11	65
Cottolene	Cottoleo	12	70
Dyspepticure	Dyspepticide	13	75
Siphon	Siphon System	14	80
Nubia	Nubias	15	85

Professor Woodworth has said that "an order series assumes to some degree the character of a graduated scale."⁶ The sample scale may then be derived from Table IV. Scale I. contains 15 pairs of

⁵ For further information concerning the aims and scope of mental tests consult, "Report of the Committee on the Academic Status of Psychology; A Survey of Psychological Investigations with Reference to Differentiations between Psychological Experiments and Mental Tests," *Amer. Psychol. Assn.*, December, 1916.

⁶ *Op. cit.*, p. 4.

trade-marks, representing every amount of confusion in the Uninformed group. Column I. gives the originals, 2 the imitations, 3 the order of confusion from least to most, and 4 the per cent. of confusion. With two exceptions the distances between the steps are equal. For a number of reasons, some of which have been mentioned, the scale is not one that can be adopted by the courts; but for the purpose of illustration, let us assume that it is ready for use. Later on, the characteristics of a suitable scale will be considered. Let us assume that the trade-marks "Welcome—Welcome A. Smith" to "Royal Irish Linen—Royal Vellum" inclusive are non-infringements, and that those from "Beats-All—Knoxall" to "Nubia—Nubias" are infringements. In order to set the limits of legal and illegal amounts of confusion it may be imagined that the legislature or the courts decided that under the conditions of these experiments an imitation causing over 30 per cent. confusion is illegal and one causing 30 per cent. or less is legal. To investigate the question of infringement or non-infringement in a new case in court, it would be necessary by psychological experiment to find the amount of confusion caused by the imitation in respect to its original, and then to compare this amount with the limit of infringement on the scale. This may be done in two ways.

One way would be to test the confusion between the trade-marks in a new case under the same conditions as were those of the scale. Let us suppose that "Walkeasy" is the original trade-mark in the new case and "Waulkwell" the imitation; and that 10 per cent. of the individuals confused the latter with the former, as they really do when used in connection with the name of the article.[†] As 10 per cent. of confusion falls within the bounds of the legally allowable amount of confusion, "Waulkwell" is a non-infringement and is permitted to exist. If, on the other hand, "Ceresota—Cressota," the conflicting trade-marks in another new case, give 80 per cent. confusion, as they do,[†] the confusion caused by the imitation "Cressota" falls within the bounds of the illegal amount of confusion. It is declared an infringement and its use is restrained. Thus is rendered a psychological decision following an objective and scientific method, and omitting none of the requirements and technicalities of the law.

In the second way of using the scale a number of individuals are asked to match independently as closely as possible the new pair to some pair on the scale, and to assign to it the corresponding per cent. of confusion. From the average per cent. of confusion of the

[†] See Table IV., pp. 39–41.

gradings thus obtained, it may be determined whether the imitation is an infringement or a non-infringement, according as the amount of confusion lies above or below the limit of infringement. The second method may require less time than the first, but as the rating is less objective than the recognition procedure and different from the actual conditions giving the scale, it may not be as accurate. Both methods are, however, much superior to the judicial procedure.

A psychological scale of confusion for measuring the deceptive similarity between trade-marks is more complicated than would at first be supposed. In the first place the scale should be made up of pairs of word trade-marks that were litigated in the highest courts. Some should be infringements and some non-infringements. It is important that they should be selected from only simple cases in which the decision of infringement or non-infringement clearly appears to be colored by nothing else than the likelihood of confusion of just the two word trade-marks. More complicated cases in which other points aided in deciding this question should not be included. The pairs of trade-marks from the simple cases represent then decisions that are both legally and psychologically homogeneous.

The recognition method with the subjects uninformed would fulfill best the legal and psychological requirements. It is better to experiment with the trade-marks alone, not in connection with the names of their articles. The addition of the latter in the experiment changes not only the absolute but also the relative amounts of confusion of the trade-marks. Many more degrees of confusion should be included in the scale and should spread over the whole range, *e. g.*, from 0 per cent. to 100 per cent. of confusion. The difference between the degrees should be equal or very nearly so. The subjects should come from many walks of life. Several hundred subjects should at least be tested. The questions of infringement and non-infringement must be fixed in terms of amounts of confusion. This may be done in two ways. According to the one the legislature or the courts may decide these amounts under certain experimental conditions. Either a point or a space on the scale may divide the legal from the illegal amounts of confusion. According to the other the standards of infringement and non-infringement may be fixed by two averages with their probable errors, one representing the average amount of confusion of a number of infringements, and the other of a number of non-infringements. Those trade-marks composing the scale should be so selected after experimentation that only infringements should lie in the illegal and non-infringements in the legal limits.

The proposal to give a precise meaning to the term infringement would be likely to meet with opposition. In his chapter on Infringement Hopkins writes:⁸

"In conclusion it is important to bear in mind that courts of equity have always avoided laying down any hard and fast rules by which to determine what constitutes fraud. The reason for this absence of set rules has been well stated as follows: "Were courts of equity to once declare rules prescribing limitations with their power of dealing with it, the jurisdiction would be perpetually cramped and eluded by new schemes which the fertility of man's invention would contrive.""

It would certainly be imprudent to ignore this legal maxim, but it would be even more so not to see how the psychological methods do actually work.

The scale we have constructed on the basis of confusion is not an absolute scale, *i. e.*, it does not start from zero or "just not any of" confusion. In this respect it is inferior to the scales in the physical sciences. The advantage in having an absolute scale lies in being able to make a "time as ——" comparison. Four pounds is twice as heavy as 2 pounds, and 3 feet is one third as long as 9 feet. But we cannot say that 50 per cent. of confusion is twice as confusing as 25 per cent. of confusion, because we do not know that the 50 per cent. is twice as far from 0 per cent. as 25 per cent. is. Even if the scale contained a pair of trade-marks which gave 0 per cent. of confusion among 1,000 individuals, testing a few more thousand individuals might show some evidence of confusion. However, just a little confusion might be due to chance. Other things being properly accounted for, an absolute scale would be preferable, as it would be more reliable. The larger the number of individuals that the percentage scale of confusion represented the more it would tend to be absolute.

4. COMPARISON OF THE RESULTS OF THE ORIGINALS AND IMITATIONS

This section treats of the relations to each other of the amounts of the various kinds of recognition of the originals and imitations in the Uninformed, Informed, and Control groups. The first column in Table V. gives the number of pairs of the originals and imitative trade-marks that entered into the calculations of the succeeding columns. Column 2 indicates the limits of the amounts of confusion of the trade-marks in the Uninformed, and column 3 the

⁸ "The Law of Trademarks, Tradenames, and Unfair Competition," 1905, 303.

⁹ *Weinstock, Lubin & Co. v. Marks*, 109 Cal. 529-539.

difference between these limits. Column 4 shows the average per cent. of confusion in the Uninformed, and column 5 the probable error of the average. Column 6 shows the average per cent. of incorrect identifications or confusions of these trade-marks in the Informed. The remaining columns up to 12 are self-explanatory. Column 12, however, gives the correct identifications of the originals in the Control, the imitations not figuring in this group. All the percentages of the preceding Table IV. are condensed in Table V.

TABLE V

THE RECOGNITION SCORES AND THEIR PROBABLE ERRORS IN THE UNINFORMED, THE INFORMED AND THE CONTROL GROUPS FOR DIFFERENT TRADE-MARKS OF VARIOUS AMOUNTS OF CONFUSION

No. of Pairs of Trade-Marks	Uninformed Group				Informed Group						Control Group	
	Range of Per Cent. of Confusion	Difference between Extremes of Range ¹⁰	Av. Per Cent. Confused	P. E.	Av. Per Cent. Recognized As:						Av. Per Cent. of Correct Ident. of Originals	P. E.
					Identical	P. E.	Changed	P. E.	New	P. E.		
9	5-20	15	14	1.5	6	1.5	72	3.0	23	3.4	83	1.3
16	30-40	10	34	.8	19	1.8	58	1.4	25	1.4	74	2.8
21	45-50	5	46	.3	23	2.0	47	2.0	30	1.5	81	1.6
7	55-65	10	61	1.2	32	5.9	37	5.7	31	4.4	90	2.3
7	70-85	15	76	1.6	30	4.1	46	4.0	24	3.2	86	2.1

The first row of figures reads as follows: The first 9 pairs of trade-marks or the lowest 9 in the percentage of confusion in the Uninformed range in percentage of confusion from 5 per cent. to 20 per cent., a difference of 15 per cent.; the average percentage of confusion of these trade-marks is 14 with a probable error of 1.5. In the Informed group the average percentage of confusion for these same 9 pairs of trade-marks is 6 with a probable error of 1.5 etc. The second row gives the average results of the next 16 pairs of trade-marks of higher confusion in Table IV.

Column 4 and 6 show that an increase of confusion in the Uninformed is accomplished with an increase of confusion in the Informed, with the exception of the two highest degrees in the Informed; along the entire range confusion in the Informed is on an average about one half that in the Uninformed. The widest departure from this is with the trade-marks of the highest degree of

¹⁰ The differences in this column could have been made equal instead of unequal had there been a sufficient number of trade-marks to give reliable averages at every step.

confusion, the average per cent. of confusion (30) in the Informed being about 39 per cent. of the average per cent. of confusion (76) in the Uninformed. The difference between 30 per cent. and 32 per cent. is not large enough to be reliable as it is covered by the probable errors or is within the limits of chance.

Column 8 indicates in general also the natural result. In other words the lower the degree of deceptive similarity or confusion between two trade-marks the greater is the ability to recognize the change. This statement is true with the exception of the two lowest scores (which correspond to the same trade-marks as in the exception in the previous paragraph). The difference between 37 per cent. and 46 per cent. is covered by the probable errors. With trade-marks of the lowest degrees of deceptive similarity the average per cent. of correct recognitions of change (72) is about 5.1 times greater than the score of confusion in the Uninformed and 12 times it in the Informed. The other degrees show less difference; when the average per cent. of confusion in the Uninformed is 46, the average per cent. of correct recognitions of change in the Informed is 47. With the highest degrees of deceptive similarity the average per cent. of confusion in the Uninformed (76) is 30 per cent. more than the score of correct recognitions of change (46).

Column 10 shows the average per cent. of trade-marks recognized as new. It is seen that the scores do not fall into serial order, but follow a haphazard arrangement. The significance of this is that these scores are, in general, no indication of confusion. They are therefore based on recognitions that are determined either by a failure to note any resemblance or difference between the original and imitation, or by the forgetting of the original. It will be noticed that the corresponding scores of the 2 groups of trade-marks that were exceptions above are not this time reversed; but their amounts are not in their proper relative positions; the difference between them is covered by the probable errors.

Column 12 shows that the amounts of correct identifications of the originals in the Control do not fall into serial order. They are about the same whether the imitations cause much, moderate, or little confusion. In other words those originals that were most often displaced by their imitations were just as well recognized as were those that were least often displaced. Therefore, these differences in amounts of confusion are chiefly due to the degree of deceptive similarity between the originals and imitations and not to a difference of memory of the original. In the last row the average percentage of confusion of the imitations in the Uninformed is 2

per cent. higher than the average per cent. (74) of correct identifications of the originals in row 2. Tho the difference is covered by the probable errors it is seen that some imitations on the average resemble their originals as much as some originals are identified with themselves.

5. INTROSPECTIVE NOTES

At the close of the experiment the following question was put to each observer. "How did you react when the words were shown to you in the presentation and in the test?" The observers stated generally that in the presentation they had time to do no more than read the words. Some, however, articulated the words and others made associations with them. In the Informed experiment one observer made associations with the initial letters, another noted particularly the ends of the words, and in several cases imagery was noted as being present in the presentation and test. A few observers articulated also in the test. The observers in the Uninformed experiment often made casual remarks while making their recognitions in the test, and so gave voluntary and uncalled for introspections about the effects of the imitations on them. Many said that there were not the same number of slips in the test as in the presentation. One said, "I notice slight changes;" a second, "Some names are mixed up;" a third, "Do you have the same product with different trademarks;" and a fourth, "Do you mean exactly the same?" Still another said, "I saw 'Six Little Tailors' the first time, but this is 'Six Big Tailors,' are they meant to be the same or did you make a mistake?" Sometimes before recognizing an imitation it would be set aside to see whether its supposed original would turn up later. In a few cases when the observer became convinced of the presence of the imitations, he stated that in the beginning of the experiment an imitation was incorrectly identified.

While some were apparently in doubt as to the presence of the imitations and before they had decided upon it, I often caught them trying to read the answer from my facial expression or looking there for a clue. Furthermore, some of the observers gave clear indication by their curt expressions and behavior that they had noticed a trick in the imitations. Altho some became aware of the imitations after the first one met, others were not conscious that there had been imitations present even at the end of the experiment.

6. SUMMARY

1. When the individuals are *unaware* of the presence of imitations they confuse on the average 44 per cent. of the imitations with the originals, and correctly discriminate 56 per cent.

2. When the individuals are *aware* of the presence of imitations they confuse on the average 23 per cent. of the imitations with the originals, correctly discriminate 51 per cent., and fail to recognize 26 per cent. of the imitations as resembling the originals.

3. The correct identifications of the duplicates of the originals are about 5.3 times as numerous as the incorrect discriminations.

4. Every imitation, non-infringements as well as infringements, cause some confusion among the individuals *unaware* of their presence.

5. The scores of confusion of the imitations do not divide into two distinct groups, those likely to deceive and those not likely to deceive, but their distribution forms a continuum. The findings in the last two statements discredit the present legal treatment of imitations.

6. The construction and application of a psychological scale for the measurement of deceptive similarity of two trade-marks would be the most scientific method of determining the question of infringement.

7. The lower the degree of deceptive similarity of two trade-marks the less is the confusion and the greater is the ability to recognize the change.

8. The originals that are most often displayed by their imitations are just as well identified as those that are least often displaced.

9. The individuals who were *aware* of the presence of the imitations at the beginning of the experiment were affected in a variety of ways by them. Some noted their presence after meeting a few, and others did not even at the end of the experiment.

CHAPTER IV

RESULTS OF THE RELATIVE POSITION EXPERIMENT

1. RESULTS FOR THE SEPARATE TRADE-MARKS

IN this experiment a number of individuals judged the deceptive similarity between the trade-marks with the object of ascertaining the relative differences, not the exact amount of confusion. "The ability to perceive degrees of difference and to arrange objects in an ordered series," Professor Woodworth writes,¹ "is a fundamental and significant fact in psychology." While an individual may be unable to state the correct reasons for his judgments or to completely analyze the similarities and differences between the trade-marks, yet his judgments are significant. In the words of William James: "In ethical, psychological, and esthetic matters, to give a clear reason for one's judgment is universally recognized as a mark of rare genius."² The single judgment of any individual is a subjective and variable fact, so that an individual's judgment may not be the same at one time as at the next time, nor like that of his neighbor's. In order therefore to obtain reliable results in our experiments the relative position of each pair of trade-marks is determined by the average of the independent gradings by 50 individuals. In carrying out this experiment the test material is not presented to the subject in the same manner as in the recognition experiments. In the two kinds of experiments some of the mental processes involved, and the reactions of the subject, are different. But for all that there are certain resemblances in the mental processes, for recognition implies some judgment, and judgment implies some recognition.³ We must not now, however, dwell on this subject for our interest lies chiefly with the objective results and their comparison, rather than on the psychological principles underlying the methods.

Table VI. presents the relative degrees of confusion of the trade-marks in the relative position experiment and the scores corresponding to them in the recognition experiments. The fifth, sixth, and seventh columns give the results of the former. The fifth gives the

¹ *Op. cit.*, p. 3.

² "Principles of Psychology," 1890, II., 365.

³ E. S. Woodworth, mimeographed lecture notes on *Perception*, 1917, p. 1.

TABLE VI (Continued)

				Relative Position		Recognition Groups			Control			
				Order	Grade	Per Cent. Correct	Uniformed	Informed	As:	Per Cent. of Control		
				Trade-Marks	Imitative	Name of Article	Identical	Changed	Per Cent. of Control	Per Cent. of Control		
I	Sorosis	Original	Sartoris	Shoes	30	4.7	.88	45	5	70	25	90
N	Ma-Le-Na		Man-a-lin	Medicine	31	4.7	.88	45	15	60	25	90
I	Seafoam		Sodafoam	Baking Powder	32	4.7	.88	45	35	50	15	60
I	Carbolineum		Oreo-Carbolin	Preserving Paint	33	4.7	.81	50	20	30	50	80
I	Shipmate		Meesmate	Galley Stove	34	5.0	.85	40	15	50	35	65
I	Green River		Green Ribbon	Whiskey	35	5.3	.84	50	15	50	35	95
I	Nitro		Nitro-Hunter	Firearms	36	5.3	.81	60	10	35	55	100
N	Social Register, Newport		Newport Social Index	Directory	37	5.5	.88	50	20	40	40	80
I	Yusea		U-C-A	Incandescent Lights	38	5.8	.85	20	10	70	20	80
I	Maizena		Maisharina	Corn Flour	39	5.8	.88	45	30	40	30	80
I	Pep-Kola		Pepko	Tonic	40	6.2	.18	35	40	45	15	80
N	Electric		Electric Light	Flour	31	6.2	.81	50	0	70	30	75
I	Amber Bead		Amber	Beer	32	6.3	.88	45	40	40	20	75
N	Muresco		Murafresco	Wall Covering	33	6.3	.18	65	25	60	15	90
I	Trenton		Trenton Style	Pork Roll	34	6.4	.88	65	55	10	35	85
N	Old Country		Our Country	Soap	35	6.5	.84	45	20	40	40	75
I	Dyspeptieure		Dyspepticide	Medicine	36	6.6	.83	75	35	60	5	95
I	Cyclo		Cyclo Prize	Carpet Sweeper	37	6.7	.81	45	10	55	35	75
I	Uno		Ino	Medicine	38	7.0	.19	30	20	60	20	100
N	S. B.		B. & S.	Cough Drops	39	7.1	.88	35	30	70	0	80
I	Cottolene		Ottoleno	Substitute for Lard	40	7.1	.81	70	40	35	25	80
I	Worth		Our Worth	Edge Tools	41	7.3	.18	40	20	55	25	85
N	Magie		Magico	Cleaner	42	7.6	.19	45	40	30	30	60

TABLE VI (Concluded)

Decision	Original	Trade-Marks	Imitative	Name of Article	Relative Position			Recognition Groups			Control Per Cent. of Cor- rect Idem. of Originals
					Order	Grade	Id.	Uninformed	Inform	Changed	
								Per Cent. Con- fused	Per Cent. Re- cognised	Identical	
I	Ceresota	Ceresota	Cressota	Flour	43	7.9	.15	80	25	65	10
I	German Sweet	Sweet German	Sweet German	Chocolate	44	8.0	.14	50	25	50	25
I	Nubia	Nubias	Nubias	Cigarettes	45	8.3	.15	85	40	30	30
I	Capital	Capitol	Capitol	Coffee	46	8.8	.11	45	45	40	15
I	Johnston's	Johnson's	Johnson's	Chocolates	47	8.9	.09	65	75	15	10
	Drinket	Drinket	Drinket	Coffee	48	10.	.00				
	Quickwood	Quickwood	Quickwood	Collars	49	10.	.00				
	Whiz	Whiz	Whiz	Stove Polish	50	10.	.00				

order of confusion from least to most as determined by the average grades, the sixth gives the average grade of confusion, and the seventh the probable error of the grade. Columns 8-12 give the results of these trade-marks in the recognition experiments. Where the grades are equal their order is determined by the amounts of confusion in recognition. When they are arranged in an ordered series two pairs of trade-marks may differ slightly or greatly in confusion. The grades and their probable errors indicate such inequalities in the spacing of the series. When the grades of two pairs of trade-marks differ little, we may conclude that their amounts of confusion really differ little, and vice versa. The variability of the grade as shown by the probable error permits us to draw a similar conclusion. The probable error of a measure states the unreliability of the measure, or the probable approximation of the true measure (calculated from an infinite number of cases) to the obtained measure (calculated from 50 cases in this experiment). The probable error of the average shows within what limits the chances are even that the obtained average is correct. The probable error 0.25 of the grade 5.0 of "Shipmate—Messmate" indicates that the chances are even that the true average lies between 4.75 and 5.25, or outside it. The chances of true average being far outside this range decreases very rapidly. When the probable error is large, the true position of the pair of trade-marks is not well established, the reason for this probably being the small difference in confusion between this pair of trade-marks and those adjacent to it in the series. For a small difference is more likely to be misjudged than a large difference. Thus the larger probable errors indicate that the order is less certain, and the difference between one pair of trade-marks and the next on the list is less. The probable errors in Table VI. are generally small showing that the order is well established. Ordinary arithmetic does not apply to measures by relative position. We cannot say that grade 7.0 is twice as high as grade 3.5, or that the second grade from the highest plus the fifth is equal to the third plus the fourth.

Glancing down columns 6, 8, and 9 it will be observed that in general the higher grades have the higher scores of recognitive confusion, tho the correspondence between the 3 orders is not exact. Every pair of trade-marks, dissimilar, random, and litigated received some rating of confusion. The grades do not divide into two separate groups, suggesting those likely to cause confusion and those not likely to cause confusion; their distribution forms a continuum, as in the case of the confusion scores. The grades of the

litigated trade-marks (from "Holeproof—Knotair" to "Johnston's—Johnson's" inclusive) spread over about eight tenths of the series, and show that there are no wide gaps in relative degrees of confusion, the widest being 1.1 (between grades 2.4 and 3.5, and between 8.9 and 10.0).⁴ The difference between the grades are generally only a few tenths of a unit. In several instances there are two to four equal grades. The frequencies of the grades resemble a normal distribution.

Examining the litigated trade-marks we find that "Holeproof—Knotair" with the grade of 2.0 has the lowest grade; "Johnston's—Johnson's" with the grade of 8.9 the highest; and "Capital—Capitol" with the grade of 8.8 the second highest, the difference between the latter two being slight, being respectively 1.1 and 1.2 below the ratings for the identical pairs. It is easy to see why the last 10 pairs received the highest positions. While some pairs seem to deserve as high a rating as those above them, it should be remembered that the average grades representing the combined judgments of 50 individuals possess more validity than any single one. "Capital—Capitol" got perhaps a lower score in the Uninformed than it really deserves; but in the Informed it is satisfactory. These two trade-marks are peculiar in that their resemblances have been particularly noted before the experiment by many. In school the attention of children is usually directed to the similarity in spelling and the related significance of these words. In the relative position experiment the existence of this fact does not influence the judgments; we may therefore consider its results in this case more valid. Furthermore, the results of the relative position experiment on the whole are the more reliable as they come from 50 subjects and those in each of the recognition experiments from 20.

The artificial matings hold distinctive positions at both extremes of the scale. As might easily have been foretold the three identical matings were assigned to grade 10 by every observer. No litigated pair of marks received this average grade, altho some individuals placed various other trade-marks in this grade occasionally. The dissimilar and random matings occupy the lower limit of the scale. They are all lower than the lowest grade of the litigated marks. The three dissimilar matings do not have all equal scores, nor do the random ones. The range of the former is 0.1 to 0.3, of the latter 0.2 to 1.0. The lowest artificial mating is the dissimilar one, "Syphon—Black Diamond" with the grade of 0.1; the highest

⁴ It is not believed that this difference of 1.1 in these two cases is really equal, the latter is probably larger.

artificial mating is the random one, "White Rock—Stonetex" with the grade of 1.0. Even a glance at the dissimilar and random matings shows that "White Rock—Stonetex" has quite markedly more deceptive similarity than the others. It is 1.0 lower than "Holeproof—Knotair" the lowest litigated pair.

It has already been pointed out that the mental processes of the observer recognizing an imitation are substantially similar to those of a purchaser presented with an imitation in daily life. Likewise, the mental processes of an observer judging and grading trade-marks in the relative position experiment bear a certain resemblance to those of a judge deciding the question of infringement of trade-marks in a case at the bar. A comparison of the mental processes of the observer and of the judge will show the superiority of the experimental procedure over the legal.

When the court has to decide on the question of confusion between two word trade-marks its judgment is usually based on the basis of three sources of facts. It hears the briefs of the lawyers for and against; it decides whether there is any likelihood of confusion between the trade-marks; and it considers how these new marks compare with previously litigated infringements and non-infringements. The judge in the last performance is doing something similar to that which the observer in the experiment is doing. But the judge has only two categories in which to register his judgment, namely: those that are likely to cause confusion and those not likely to cause confusion; the observer has 11. Consequently the judgments made by the latter are much finer. When as a result of an error a trade-mark is assigned to the wrong category by a judge, the error is large and significant; in the experiment the finer grading reduces it greatly. Strictly the legal category "not likely to cause confusion" would be located on our scale at or near grade 0; and the legal category "likely to cause confusion" anywhere from grade 0 to and inclusive of grade 10. The fact that the legal categories are ill-defined and without quantitative significance cause them to be variously interpreted by different judges. Hence, the inconsistency of many legal decisions is partly accounted for.

The experiment is mathematically more valid or accurate than the court in that its results are determined by a larger number of individuals, whereas the basis of the decision is the opinions of only a few judges. Inasmuch as the experiment employs a far greater number of observers it necessarily yields results that are much less likely to be the outcome of the chance bias of a few individuals. In the average of a large number of judgments chance bias is

neutralized, and the result represents the tendency of all the observers and is nearer the truth. The court cannot help being influenced by the counsels of plaintiff and defendant, thereby tending to partiality to one or the other. A very able trade-mark lawyer would undoubtedly have a far better chance of winning a case than would his less able opponent. Such unfairness is entirely eliminated in an experiment scientifically conducted.

2. PSYCHOLOGICAL PRINCIPLES FOR DETERMINING DANGEROUS IMITATIONS

Infringers employ a number of ways to copy a trade-mark. A few are bold enough to make the imitation identical with the original, while most try to make it more or less similar. In judging whether a trade-mark is an illegal imitation the courts have no rules or principles to guide them. An analysis of the methods of making imitations can furnish general principles that may be of assistance to the courts. An examination of the imitations that have proved most dangerous in the experiments will enable us to formulate such principles, and tho the principles cannot be followed rigidly it will certainly be helpful to bear them in mind. In addition to the important matter of familiarity, confusion of trade-marks may be broadly analyzed as dependent on visual appearance, sound, linguistic formation (fancifulness, oddity, infrequency, structure,—compound or hyphenated), meaning, and any combination of these factors.

Among the imitations are found substitutions, transformations, reversals, omissions, and additions of words, syllables, letters, hyphens, and capitals. These changes are made at the beginning, middle, end, before, or after the word or words. The letter added, omitted, or changed may be identical, similar, or dissimilar. In some cases the meaning of the imitation may be identical, similar, or even the opposite of the whole or of part of the copied original. A few of the imitations aim at similarity in meaning alone, as in "Holeproof—Knotair";⁵ most adopt the other features of the original also. Similarity in one of these features usually includes similarity in the others.

The analysis of the methods of constructing the following 10 most confusing pairs of trade-marks will illustrate many of these points. In "Johnston's—Johnson's" the imitation is the same as

⁵ Most persons pronounce the imitation "Knotair," "No tear," but a few pronounce it "Not air," and thus can see no similarity in meaning between it and the original.

the original with the omission of one internal consonant. In "Capital—Capitol" the imitation is the same as the original with the exception that one internal vowel is replaced by another, the imitation being similar in sound and related in meaning. In "Nubia—Nubias" the imitations makes the original plural by the addition of a consonant. In "German Sweet—Sweet German" the imitation simply reverses the positions of the two words in the original. In "Ceresota—Cressota" the imitation reverses the position of two adjacent internal letters, and a consonant (the same kind as the following one in the original and in the imitation) is substituted for a vowel (the same kind as the one of the two reversed letters in the imitation, and which is the second letter preceding it in the original); thus the imitation is one syllable shorter than the original. The words resemble each other in sound and partly in significance. In "Magic—Magico" by suffixing a final vowel a syllable is added, the similarity in meaning being retained. In "Worth—Our Worth" the imitation simply places a personal pronoun before the original. In "Cottolene—Cottoleo" the imitation takes the first seven letters, and substitutes for the 2 final letters a vowel, thereby adding another syllable. In "S. B.—B. & S." the two initials are reversed and an ampersand is inserted between them. In "Uno—Ino"⁶ the imitation substitutes another vowel, similarity in meaning being also suggested. In Table IV. among the 10 most confusing pairs that are not in Table VI. are the following, In "Siphon—Siphon System" a word is added after the original. In "West End—East End" the imitation substitutes for the first word a word of the opposite meaning which is similar in length and somewhat so appearance. In "Willoughby Lake—Willoughby Ridge" for the second word is substituted another similar in length, belonging also to geographical terminology.

It may be seen from this that a definite classification of the methods of imitating is not always possible, as many imitations are the results of a number of different devices. In "Ceresota—Cressota" for example, the imitation omits a letter, adds one, reverses two, and is one syllable shorter than the original. The length, or the number of letters, syllables, and words in a trade-mark is an important consideration in judging confusion. Other things being equal, a slight change in a long trade-mark is more deceptively simi-

⁶ The marks are generally pronounced "You know—I know"; but one individual well versed in English etymology, saw no similarity in meaning as he pronounced them "Oo know—In know." This instance and the other just noted show that similarity in meaning may be conveyed to one individual and not to another, according to the pronunciation of the original and the imitation.

lar than in a short one, and hence will cause greater confusion. Feingold wisely considers this a matter of much importance.⁷ It should also be remembered that trade-marks may differ greatly in length, while a part that is unappropriated by the imitation may be identical with an essential part of the original.

To determine whether imitations are dangerous the following principles are suggested by Tables IV. and VI. as a useful general guide.

1. *Omissions*.—Imitations differing from the originals only by omitting 1, 2 or 3 letters, 1 or 2 syllables, or 1 word.

2. *Additions*.—Imitations differing from the originals only by adding 1, 2 or 3 letters, 1 or 2 syllables, or 1 word.

3. *Substitutions*.—Imitations differing from the originals only by substituting 1, 2 or 3 letters, 1 or 2 syllables, or 1 word in the same or different positions in the trade-mark.

4. *Changes in Positions*.—Imitations differing from the originals only by transpositions or reversals of 1, 2 or 3 letters, 1 or 2 syllables, or 1 or 2 words.

Many imitations will have to be examined in connection with more than one of these statements. Because of the variety of features and factors operative in some cases of confusion, the above classification cannot be expected to be as accurate as a mathematical formula. In some cases, as may be seen from Tables IV. and VI., they will apply; in others they will not. It should be borne in mind too that the length of a trade-mark must be taken into account in connection with the above principles.

Finally, the names of the commodities in Table IV. show roughly that the trade-marks most often imitated are those of household articles, then in decreasing order those of foods, medicines, clothing,—firm names and liquors in about the same proportion. The most reliable way, however, of finding which articles are most frequently imitated would be to consult a far greater number of court records.

3. SCALE OF RELATIVE POSITION CONFUSION

The purpose of constructing a scale of relative position confusion is the same as that of recognitive confusion, namely to supplant the present judicial procedure. The relative position scale, tho it too is not ready for adoption, should be considered in connection with the remarks made on Scale I. Scale II. is derived from Table VI. It contains 18 pairs of trade-marks, representing 18

⁷ *Op. cit.*

degrees of confusion. In view of several circumstances it was not possible to make the distances between the steps equal. The smallest is 0.3, the largest 1.2, and the average of all 0.58, or nearly six tenths of a step. Scale II. is superior to Scale I. in one respect; the grade of confusion being based on the trade-marks, not as in Scale I. on both the trade-marks and the name of the article. When the Uninformed subjects mistook "Grenade" for "Grenadine" the appearance of the word "Syrup" in both connections tended to cause some of the confusion. The application of Scale II. follows the second method described under Scale I.

SCALE II

SCALE OF RELATIVE POSITION CONFUSION OF TRADE-MARKS

		Order	Confusion Grade	P. E.
Syphon	Black Diamond	1	.1	.08
Everstick	Herringbone	2	.7	.18
White Rock	Stonetex	3	1.	.11
Holeproof	Knotair	4	2.	.21
Royal Irish Linen	Royal Vellum	5	2.4	.20
Rubberet	Rubber-vule	6	3.5	.28
Beats-All	Knoxall	7	4.1	.27
Bear Lithia Springs	Great Bear Springs	8	4.5	.28
Shipmate	Messmate	9	5.0	.25
Social Register, Newport	Newport Social Index	10	5.5	.28
Pep-Kola	Pepko	11	6.2	.18
Dyspepticure	Dyspepticide	12	6.6	.23
Uno	Ino	13	7.0	.19
Magic	Magico	14	7.6	.19
German Sweet	Sweet German	15	8.0	.14
Nubia	Nubias	16	8.3	.15
Capital	Capitol	17	8.8	.11
Drinket	Drinket	18	10.	.00

Let us suppose that the trade-marks "Syphon—Black Diamond" to "Royal Irish Linen—Royal Vellum" inclusive are non-infringements, and all above the latter infringements. An imitation receiving then a grade of confusion above 2.4 may be imagined to be illegal, one receiving 2.4 or less legal. When a new case comes up the pair of trade-marks can be compared with the various steps on the scale. A number of individuals are asked to match independently as closely as possible the new pair to one on the scale, and rating it the corresponding grade. From the average grade of confusion thus obtained, it may be determined whether the imitation is an infringement or non-infringement. If the average grade of these ratings is 2.4 or less the imitation is a non-infringement, if more an infringement. If for instance "Holeproof—Knotair" received an average

grade of 2.0, it would be a non-infringement, and if "Our Country—Old Country" received 6.5, it would be an infringement.

Separate scales devised on the basis of each of the three factors contributing to confusion would be of theoretical and practical interest. A comparison of the gradings of the same trade-marks in the different scales would tell the correlation between deceptive similarity in appearance, similarity, meaning, and all combined. The practical importance of the scales would lie in the fact that the trade-marks could be rated on the particular factors that were the cause of confusion. There are quite a number of trade-marks that are likely to be confused usually under visual conditions, or in sound. By grading the former on the scale for visual confusion, and the latter for auditory confusion, more detailed information is obtained. In determining the question of infringement these grades might also be considered in connection with those on the scale of general confusion.

4. COMPARISON OF THE RELATIVE POSITION RESULTS WITH THOSE OF RECOGNITION

One of the main objects of this chapter, still to be considered, is the relation between confusion as determined by relative position and recognition. Inspection of Table VI. gives a general impression that there is a positive correspondence between the two orders. By working out correlations and by epitomizing these results we may obtain, however, a better impression. The latter is done in Table VII., by averaging in four groups the relative position and recognition scores of the trade-marks "Holeproof—Knotair" to "Johnston's—Johnson's" inclusive in Table VI. Table VII. is formed and reads like Table V. The 9 trade-marks in the first row are "Holeproof—Knotair" with the grade of 2.0 to and including "Bestyette—Veribest" with the grade 4.4, etc.

The average grades of confusion run in column 4 from 3.5 to 7.8, and in volume 6 the corresponding scores of confusion in the Uninformed run from 29 per cent. to 55 per cent. with steady increase at each step. In column 8 the corresponding scores of confusion in the Informed run with quite a regular increase from 8 per cent. to 36 per cent. Column 10, likewise in agreement, shows at each step that the higher the grade of confusion the lower the ability to recognize the change in the imitation. Column 12 shows that the incorrect discriminations do not depend on deceptive similarity. Column 14 shows also that the identifications of the originals are not related to the degree of confusion. In other words, the

order as determined by the recognition scores of confusion agrees with the order by the relative position grades. It will be noticed that the orders of the recognition scores of confusion and change are in somewhat closer agreement with each other and with that of the relative position grade than with themselves in Table V. This is an indication that the order established in Table VII. by the relative position grades is more valid for relative differences than that of confusion in the Uninformed in Table V.

TABLE VII

THE AVERAGE GRADES OF CONFUSION, AND THE RECOGNITION SCORES IN THE UNINFORMED, THE INFORMED AND THE CONTROL GROUPS, WITH THE PROBABLE ERRORS FOR DIFFERENT TRADE-MARKS OF VARIOUS AMOUNTS OF CONFUSION

No. of Trade-Marks	Relative Position		Uninformed		Groups Informed						Control			
	Range of Grades of Confusion	Difference between Extremes of Range ^a	Av. Grade	P. E.	Av. Per Cent. Confused	P. E.	Av. Per Cent. Recognised As:						Av. Per Cent. of Correct Ident. of Originals	P. E.
							Identical		Changed		New			
9	2.0-4.4	2.4	3.5	.14	29	3.1	8	2.0	65	2.5	27	2.5	86	2.0
10	4.5-5.5	1.0	4.9	.08	44	2.0	17	2.1	52	3.2	31	3.2	83	2.7
10	5.8-6.7	.9	6.3	.06	49	3.1	26	3.6	49	3.7	25	2.5	81	1.4
10	7.0-8.9	1.9	7.8	.15	55	4.4	36	3.2	45	4.0	19	2.2	84	2.2

The relation between the various orders may also be seen from their correlations. They are all positive. According to Spearman's formula^a the order of confusion in the Informed group correlates + 0.70 (P.E. 0.061) with that of the grade of relative position, that of confusion in the Uninformed correlates + 0.59 (P.E. 0.076), and that of correct recognitions of change correlates inversely + 0.47 (P.E. 0.090), and that of incorrect discriminations correlates + 0.19 (P.E. 0.109). The last is nearly a chance correlation. In Table VII. the differences in the regularity of the changes in the scores indicate also which orders correspond more closely. The probable errors of most of the correlations overlap.

All the correlations are attenuated by the fact that the names of the commodities contributed to causing confusion in the recognitions experiments, whereas the relative position experiment is free from

^a These differences could have been made more equal if we had taken six steps instead of four, but then the average would not have been so reliable.

^a The method of differences in relative positions or ranks. $\rho = 1 - \frac{6\sum D^2}{n(n^2 - 1)}$

this source of confusion. It is perhaps due partly to this that the order of confusion in the Informed received the highest correlation. Tho the name of the article appeared there it was not so much of a disturbing factor because the subjects knew that the change would be only in the trade-marks. In the Uninformed group, on the other hand, it did contribute to cause confusion between the trade-marks, and thereby lowered its correlation with the relative position grades. Finally, while the correlations demonstrate that measurement by relative position is useful as a recognition method for studying confusion, they tell against recent criticisms denying its practical value.

5. INTROSPECTIVE NOTES

How did the individual perform the task of judging and grading deceptive similarity? Did they all work in the same manner? Or did some adopt their own methods to aid them? No one line of thought was followed by all. A number of individuals put different emphasis on each of the four factors noted in the directions. The judgments of some were based mainly on similarities, while those of others on differences. Furthermore, imaging concrete situations in everyday life seemed to help quite a few. This information was obtained by asking each individual after he had arranged the trade-marks to state how he had proceeded. Only a general statement was required, not an elaborate introspection. To many of the replies obtained do not really merit the name of proper introspection, they indicate quite a variety of mental performances. Below are given 16 different statements by the 50 subjects. It would be interesting to know how much the variability of the grades depends on these differences in method.

1. Confusion.
2. Confusion and similarity.
3. Similarity in appearance, sound, and meaning.
4. Graded in order of importance by similarity in appearance, sound, and meaning.
5. Similarity in sound given high confusion rating.
6. Noted similarities more than differences.
7. Observed differences systematically.
8. Considered the ease of associating the rival trade-marks.
9. The most important words given most weight.
10. Imagined whether he would mistake the imitative trade-mark when read in a magazine advertisement for the original seen first in another part of the magazine.

11. Played the rôle of a purchaser looking at the imitation.
12. Imagined how he would react to the imitative trade-mark, having only a casual acquaintance with the original.
13. Tried to imagine the trade-mark on packages in a store.
14. Considered whether others would be confused.
15. Fancied himself a clerk in a store trying to fool the purchaser with the imitation.
16. Direct and quick comparison of the trade-marks.

6. SUMMARY

1. Every imitation, non-infringements as well as infringements, receives some grade of confusion.

2. The relative position grades of the imitations do not divide into two distinct groups, suggesting those likely to deceive and those not likely to deceive, but their distribution forms a continuum. The last two findings are in agreement with those in (4) and (5) of Chapter III, telling against the present legal procedure in regard to imitations.

3. Even the random and dissimilar matings of trade-marks receive a grade of confusion, all being lower than the litigated pairs.

4. The analysis of the methods of making imitations suggests certain general psychological principles for determining dangerous imitations. These principles include omissions, additions, substitutions, and changes in positions.

5. There are fairly high correlations of the order of confusion of the relative position grades with the two orders of confusion in the Uninformed and Informed groups.

6. In judging and grading the individuals did not follow a single line of thought, but employed methods of their own to aid them.

CHAPTER V

PSYCHOLOGICAL TESTS OF THE ACCURACY OF JUDICIAL DECISIONS¹

1. THE TESTS

WHEN the court renders a decision as to the likelihood of confusion of trade-marks, instead of establishing a fact it merely states an opinion. Unless, there is a dissenting judge the court probably believes that its decision is correct. But no court has undertaken to see whether its decision was right, nor to see whether the decision did in fact conform with the cited authorities. Scientific investigation would further suggest that even the authoritative cases be subjected to a test. As long as these things remain undone the courts are traveling in the dark. The recognition and relative position experiments that we have been examining furnish us with the means of determining the legal and psychological accuracy of the decisions. The scanty information that the decision conveys is one of its serious defects. It rarely advances beyond stating that there is or is not a possibility of confusion, and making a comparison between the trade-marks in the pending case with litigated pairs. How much more accurately the psychological methods can answer these questions has already been demonstrated.

There were 40 subjects in the recognition experiment, all of them Uninformed. There were 40 in the relative position experiment; the serial form, not the group form, being used. The nine pairs of trade-marks studied were not very familiar; as may be seen in Table VIII. There the results of the recognition and relative position experiments are given. The first column in the table shows whether the imitation in the decision was held to be an infringement (I) or a non-infringement (N). The other columns are self-explanatory.

The procedure and material has been described in Chapter II. However, an additional word might be said about the nine decisions, which are to be checked up. Five were adjudications of infringement, in which the use of the imitation was enjoined, and four were

¹ The results of this chapter appeared in a previous article by the writer, "A Psychological Study of Confusion between Word Trade-Marks," *Bull. of the U. S. Trade-Mark Assn.*, 1915, 11, 101-114.

TABLE VIII:

THE PER CENT. OF INDIVIDUALS CONFUSED, THE GRADE OF CONFUSION AND PROBABLE ERROR OF EACH OF THE INFRINGEMENTS AND NON-INFRINGEMENTS

Decision	Trade-Mark		Per Cent. Confused	Av. Grade	P. E.
	Original	Imitative			
N	Sozodont	Kalodont	28	3.6	.27
I	Nox-all	Non-X-Ell	28	4.9	.23
I	Club	Chancellor Club	35	2.7	.31
N	Bestyette	Veribest	35	4.1	.30
N	Mother's	Grand-Ma's	38	3.2	.30
I	Au-to-do	Autola	40	4.3	.31
N	Peptensyme	Pinozyme	43	5.2	.30
I	Green River	Green Ribbon	50	5.7	.29
I	Ceresota	Cressota	63	7.9	.19

adjudications of non-infringement, in which injunctions against the use of the alleged illegal imitations were refused. The results obtained from these 9 trade-marks test the accuracy of the decisions. No other circumstance or reason, as far as the records showed, determined the point of infringement or non-infringement in the decisions. This requirement had to be insisted upon, because it is only the question of likelihood of confusion of the word trade-marks that the experiments measure. If various other factors such as the question of the validity of the trade-marks, unclean hands, similarity of the type, color, or other features of the label or package entered in the decision and operated to influence the point of infringement, the experimental results of these complicated decisions could not be properly compared with each other, nor with simple decisions of confusion of just word trade-marks. It is obvious that decisions determined by confusion of word trade-marks plus certain other circumstances are not in the same legal nor psychological categories as those de-

² Ceresota, Cressota, flour; *North Western Consolidating Milling Co. v. Mausser & Cressman*, 162 Fed. Rep., 1004 (U. S. Cir. Ct.).

Nox-all, Non-X-Ell, hats; *Nox-All & Gotham Co. v. Denzer Goodhart & Co.*, 2 Trade-Mark Rep., 356 (U. S. Dist. Ct.).

Green River, Green Ribbon, whiskey; *Lang v. Green River Distilling Co.*, 148 O.G., 280 (Ct. of App. D. C.).

Club, Chancellor Club, cocktails; *In re Herbst Importing Co.*, 134 O.G., 1565 (Ct. of App. D. C.).

Au-to-do, Autola, cigars; *In re Wilcox Co.*, 162 O.G., 539 (Ct. of App. D. C.).

Bestyette, Veribest, raincoats; *New York Mackintosh Co. v. Flam*, 2 Trade-Mark Rep., 324 (U. S. Dist. Ct.).

Sozodont, Kalodont, tooth paste; *Sarg Sohn & Co. v. Hall & Buckel*, 165 O. G., 732 (Ct. of App. D. C.).

Mother's, Grand-Ma's, waxing pads; *Bromund Co. v. Columbia Wax Products Co.*, 200 O.G., 1115 (Ct. of App. D. C.).

Peptensyme, Pinozyme, digestant; *Reed & Carnick v. Waterbury Chemical Co.*, 200 O.G., 279 (Ct. of App. D. C.).

terminated simply by the confusion of just the word trade-marks. Nor could the former be properly given as authorities governing the latter, nor vice versa.

Let us now compare the recognition scores of the infringements and non-infringements. The two most confusing imitations in the recognition and relative position experiments are infringements, the lowest in the recognition is a non-infringement and in the relative position is an infringement. The non-infringement "Peptenzyme—Pinozyme" is more confusing than 3 of the 5 infringements; the non-infringement "Mother's—Grand-Ma's" is more confusing than 2 of the infringements; and the non-infringement "Bestyette—Veribest" is equal in confusion to one infringement and more so than another. Of the 2 imitations that stand at the bottom one is legal and the other illegal. The grades of confusion in relative position show likewise that the non-infringement "Peptenzyme—Pinozyme" is more confusing than the same three infringements. The three remaining non-infringements are more confusing than one infringement. In other words some of the imitations declared to be legal actually confused more individuals than some imitations declared to be illegal, and vice versa. Both experiments prove, therefore, that some of the decisions are inaccurate and inconsistent. In several of the above comparisons the differences between the scores are not large. It should also be observed that many of the pairs of trade-marks differ only little in confusion. It will be seen that the orders of confusion in recognition and relative position correspond fairly well.

The average grades of confusion here are not comparable with those in Chapter IV., tho their relative amounts are. Some recognition scores of the trade-marks recorded here and in the two previous chapters show divergences due to the different classes of subjects used and their small number.

TABLE IX

THE AVERAGE PER CENT. OF CONFUSION, THE AVERAGE GRADE AND PROBABLE ERROR OF THE FIVE INFRINGEMENTS AND FOUR NON-INFRINGEMENTS

Number of Decisions	Decision	Av. Per Cent. Confused	Av. Grade	P. E.
5	Infringement	43	5.1	.51
4	Non-infringement	36	4.0	.26

If we compute the averages of the 5 infringing and 4 non-infringing imitations in Table VIII. we get the figures in Table IX. The average percentage of confusion (43) of the infringements is 7 per cent. higher than the average (36) of the non-infringements.

The advantage here is as it should be. This is also the case with the average in relative position. The average grade (5.1) of the infringements is 1.1 higher than the average (4.0) of the non-infringements; their probable errors are 0.51 and 0.26 respectively.³ Tho the differences between the average grades show that on the whole the courts were correct in their judgments, the inaccuracies of the individual cases are covered up. The most important characteristic of these differences is their small amount. Let us consider again the recognition scores in Table VIII. In view of the fact that the largest difference between 2 infringements, "Ceresota—Cressota" and "Nox-all—Non-X-El" is 35 per cent., and that between 2 non-infringements, "Peptezyme—Pinozyme" and "Sozodont—Kalodont" is 15 per cent., the difference here of 7 per cent. between the 2 averages becomes insignificant. The grades show this discrepancy more decidedly. Here the largest difference between 2 infringements, "Ceresota—Cressota" and "Club—Chancellor Club," is 5.2, and that between 2 non-infringements, "Peptenzyme—Pinozyme" and "Mother's—Grand-Ma's" 2.0, whereas the difference between the 2 averages is only 1.1. The scores of the two supposedly distinct decisions are thus seen to overlap throughout most of their range. The differences within both classes of decisions outweigh so much the difference between the classes that for practical purposes the difference in confusion between the infringing and non-infringing imitations may be disregarded. Therefore, some of the judicial decisions are unreliable and do not represent two really different legal or psychological categories.⁴

2. SUMMARY

1. Some of the imitations declared to be legal by the courts actually confused more individuals in the recognition experiment than some imitations declared illegal, and vice versa. The results of the relative position method confirm this. Therefore, some of the judicial decisions were inaccurate and inconsistent.

2. The scores of the imitations of the two supposedly distinct decisions overlap throughout most of their range, so that the decisions do not represent two really different legal or psychological categories.

³ The probable errors are calculated from the average grades of the 9 trademarks; if they had been calculated from the individual grades they would have been much smaller, probably one half as large.

⁴ Several other experiments by the writer, as yet unpublished, confirm this conclusion.

3. CONCLUDING REMARKS

In conclusion it may be said that the adoption of the experimental method of measuring confusion of trade-marks will insure several advantages. Trade-mark legislation will become more efficient in having an objective standard by which to define an illegal imitation. Judicial decisions will become more accurate and will be freed from being blindly governed by past erroneous decisions. Business will save money by not being deprived of legal trade-marks thru inaccurate decisions, by cutting down the fees of trade-mark lawyers, and by the elimination of the opportunity of frequently appealing from the decisions. Furthermore, the state and federal governments will economize in time, money, and labor spent by Equity judges and the officials in the Trade-Mark Division of the Patent Office. Finally, while opening a new field for applied psychology the experimental method will aid in perfecting the machinery of law and its administration, and in purifying some of the unfair practices in business.

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